Supreme Court, U.S.
FILED
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MICHAEL RODAK, JR., CLERK

No. 79-408

IN THE

Supreme Court of the United States

OCTOBER TERM, 1979

CITY OF MILWAUKEE, THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE, AND THE METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE,
Petitioners,

v.

PEOPLE OF THE STATE OF ILLINOIS AND PEOPLE OF THE STATE OF MICHIGAN,
Respondents.

On Writ of Certiorari to the United States Court of Appeals for the Seventh Circuit

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Petition for Certiorari Filed
September 11, 1979
Certiorari Granted March 17, 1980

JOINT APPENDIX

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Opinion of the District Court for the Northern District of Illinois, dated November 16, 1972 ..... H-1

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Unpublished Order of the Court of Appeals for the Seventh Circuit accompanying its April 26, 1979 Opinion, dated April 26, 1979 ..... B-1

Order of the Court of Appeals for the Seventh Circuit denying rehearing, dated June 14, 1977 ..... C-1

RELEVANT DOCKET ENTRIES

5-19-72—Complaint and six copies with exhibits.

6-29-72—Motion of The State of Michigan for leave to intervene as Party Plaintiff, Proposed Complaint and Notice of Hearing.

6-30-72—Motion defendant, Metropolitan Sewerage Commission of The County of Milwaukee to dismiss summons pursuant to Rule 12(b) FRCP.

7-14-72—Interrogatories of defendants, City of Milwaukee & Sewage Commission of City of Milwaukee to be answered by Plaintiff.

7-27-72—Objections to motion for intervention (FRCP-Rule 24) On behalf of Defendants, City of Milwaukee and Sewage Commission of City of Milwaukee.

8-9-72—Plaintiff's Notice of Motion; Motion.

8-23-72—Order: Motion for leave to Intervene as Party Plaintiff by the State of Michigan—taken under Rule 13, Briefs: 20-10 & 5 BAUER, J.

8-23-72—Order: Motion to Waive Local Rule 7 A by the State of Michigan granted. BAUER, J.

8-31-72—Notice of motions, motions of defendants City of Milwaukee, and Sewage Comm. of the City of Milwaukee, to quash the summons and Memorandum in support of defendants City of Milwaukee and Sewage Comm. to quash the summons and to dismiss.

9-28-72—Motion of defendants, Metropolitan Sewerage Comm. of County of Milwaukee.

9-28-72—Motion of defendant Metropolitan Sewerage Commission to dismiss taken under advisement. Briefs instanter, 15 and 10. Ruling set for November 6, 1972—Bauer, J.

9-29-72—Plaintiff's request for production of documents.

10-10-72—Argument—Motion of City of Milwaukee and Sewage Commission of City of Milwaukee to quash summons and to dismiss—Argument—heard and concluded—Cause taken under advisement.—Bauer, J.

10-30-72—Objections of City of Milwaukee and Sewage Commission of Milwaukee to request of plaintiff for production of documents.

11-6-72—Objections of The Metropolitan Sewerage Commission of the County of Milwaukee to the request of the Plaintiff for the production of documents.

11-16-72—Order: Defendant Metro Sewerage Commission's motion to dismiss denied. (Draft) Bauer, J.

11-21-72—Order: Leave to State of Michigan to intervene and to file complaint immediately etc. Each of the parties have 20 days from this date in which to serve an answer or otherwise plead with respect to the complaint of the State of Michigan—Draft—Bauer, J.

12-11-72—Answer of defendants City of Milwaukee and Sewerage Commission of the City of Milwaukee to Complaint of the State of Illinois.

12-11-72—Answer of defendants City of Milwaukee and Sewerage Commission of the City of Milwaukee to complaint of the State of Michigan.

12-11-72—Answer of the Defendant, Metropolitan Sewerage Commission of the County of Milwaukee, to the State of Illinois.

12-11-72—Answer of Metropolitan Sewerage Commission of the County of Milwaukee defendant herein, to the Complaint of the intervening Plaintiff, People of the State of Michigan.

1-24-73—People of the State of Michigan's Notice and copy.

1-24-73—Enter order stipulation and order for leave to Intervene as party plaintiff by the State of Michigan, granted. (DRAFT) BAUER, J.

5-30-73—Plaintiff's Notice of Answers to Interrogatories.

5-30-73—Plaintiff's Supplemental Answers to the Interrogatories of the City of Milwaukee and the Sewage Commission of the City of Milwaukee.

6-14-73—Defendants' Interrogatories.

6-25-73—Defendants' Request for Production of Documents.

6-27-73—Defendants' Request for Production of Documents.

7-17-73—Answer of Intervening Plaintiff, the People of the State of Michigan, to Interrogatories of City of Milwaukee and Sewage Commission of the City of Milwaukee.

7-30-73—Defendants Milwaukee and Sewage Commission's Notice of Motion; Motion and Memorandum in Support of Motion, and copy.

8-1-73—Defendant Metropolitan Sewerage Commission's First Set of Interrogatories to Plaintiff.

7-30-73—Notice of Motion, Motion and Memorandum in Support of Motion by City of Milwaukee.

8-6-73—Defendant Metropolitan Sewage's First Set of Interrogatories to Plaintiff, State of Michigan.

8-17-73—Reply to Request for Production of Documents.

8-21-73—Notice of Motion and Motion of Metropolitan Sewerage Commission to dismiss.

8-21-73—Order: Motion to dismiss for lack of jurisdiction of subject matter taken under advisement. Plaintiff given 10 days to respond. Ruling set for November 1, 1973—Bauer, J.

9-26-73—Intervening plaintiff's notice of answer to interrogatories.

9-26-73—Answers of intervening plaintiff, The People of the State of Michigan, to interrogatories of the Metropolitan Sewerage Commission of the County of Milwaukee.

10-17-73—Order: Plaintiff's motion to file design commitment agreement for the city of Racine and the city of Kenosha and to dismiss these defendants granted and said motion continued to October 31, 1973 for response of opposing parties.—Bauer, J.

11-1-73—City of Kenosha design commitment agreement.

11-1-73—City of Racine design commitment agreement.

11-1-73—Objection of City of Milwaukee, Sewerage Commission of City of Milwaukee, and Metropolitan Sewerage Commission of Milwaukee County to the present pending motion of plaintiffs and contents of the proposed order submitted to the Court, overruled and plaintiff given leave to file design commitment agreement and to dismiss defendants City of Kenosha and City of Racine. (DRAFT) Order: Plaintiffs action against defendants Racine and Kenosha, Wisconsin dismissed etc., (DRAFT) Order: Motion of defendants City of Milwaukee, the Sewerage Commission of the County of Milwaukee and the City of South Milwaukee to dismiss the complaint denied. (DRAFT)—Bauer, J.

2-28-75—Order dated February 24, 1975: Whereas Judge Flaum was in the service of the State's Attorney's Office for Cook County at the commencement of this cause, and whereas this cause was originally assigned to the calendar of Judge Bauer who has been elevated to the Court of Appeals, it is hereby ordered that this cause is reassigned to the calendar of an individual judge of this court in accordance with the rules.—Robson, C.J. FOR THE EXECUTIVE COMITTEE. (JUDGE LYNCH)

12-19-75—Answer of plaintiffs to interrogatories propounded by the Metropolitan Sewage Commission of the County of Milwaukee. bb

12/29/75—Plaintiffs first set of interrogatories directed to defendant, The Sewerage Commission of the City of Milwaukee.

12/29/75—Plaintiffs request for production of documents directed to defendant City of Milwaukee, Wisconsin.

12/29/75—Plaintiffs request for production of documents directed to the defendant The Sewerage Commission of the City of Milwaukee.

12/29/75—Plaintiffs first set of interrogatories directed to defendant the Metropolitan Sewerage Commission of the County of Milwaukee.

12/29/75—Plaintiffs Request for production of documents directed to the defendant the Metropolitan Sewerage Commission of the County of Milwaukee.

12/29/75—Plaintiffs first set of interrogatories to defendant City of Milwaukee Wisconsin.

4/30/76—Defendant, Sewerage Commission of the City of Milwaukee's Answer to Plaintiff's First Set of Interrogatories Directed to Defendant, The Sewerage Commission of the City of Milwaukee.

4/30/76—Answer to Plaintiff's First Set of Interrogatories Directed to the Defendant, Metropolitan Sewerage Commission of the City of Milwaukee.

4/30/76—Response to Request for Production of Documents Directed to Defendant, Metropolitan Sewerage Commission of the County of Milwaukee.

4/30/76—Response to Request for Production of Documents Directed to Defendant City of Milwaukee, Wisconsin.

4/30/76—Answers to Plaintiff's First Set of Interrogatories Directed to Defendant, City of Milwaukee, Wisconsin.

4/30/76—Response to Request for Production of Documents Directed to defendant Sewerage Commission of the City of Milwaukee.

5/18/76—Defendant The Sewerage Commission of the City of Milwaukee's Request for Production of Documents Directed to Plaintiff, People of the State of Illinois ex rel William J. Scott, Set II.

5/18/76—Defendant the Sewerage Commission of the City of Milwaukee's Request for Production of Documents Directed to Intervening Plaintiff People of the State of Michigan, Set II.

5/18/76—Defendant's Second Set of Interrogatories Directed to Plaintiff, People of the State of Illinois, etc.

5/18/76—Second Set of Interrogatories Directed to Intervening Plaintiff People of the State of Michigan.

5/26/76—Defendant's Notice of Motions, Motions to Dismiss and Memorandum Brief of Defendants, City of Milwaukee, Sewerage Commission of the City of Milwaukee and The Metropolitan Sewerage Commission of the County of Milwaukee in Support of Motions to Dismiss.

5/26/76—Defendant, City of Milwaukee's Motion and Brief on Motions Presented.

7-19-76—Plaintiff's state of Illinois' answers to defendants' second set of interrogatories.

7-26-76—Intervening Plaintiff State of Michigan's Answers to defendants' second set of interrogatories.

9/9/76—Filed Response of the State of Illinois to the Motion of the Sewerage Commission of the City of Mil-

waukee for an Order Compelling Further Answers to Interrogatories by the Plaintiff State of Illinois and Compelling Production of Documents.

9/9/76—Filed Notice of Motion and Motion for Orders Compelling Answer to Interrogatories to Party and Compelling Response to Demand for Production of Documents.

9/22/76—Order dated September 9, 1976: Enter order resetting the trial from October 5, 1976 to January 3, 1977. Defendants have 10 days to respond to plaintiffs' brief in opposition to the motion to compel and plaintiff 5 days to reply (Draft).—Grady, J.

9/27/76—Order dated September 22, 1976: Defendant's motion to dismiss, motion for class action status, motion for joinder and motion for complex litigation status are all denied (draft).—Grady, J.

10/21/76—Order dated October 20, 1976: Plaintiffs are ordered to furnish supplemental answers to defendants' interrogatories and to produce all relevant documents by November 20, 1976. Defendants are ordered to furnish supplemental answers to plaintiffs' interrogatories by November 20, 1975. Attorneys fees will be assessed against any party found to be in violation of this order or to have unreasonably withheld relevant discovery.—Grady, J.

10/27/76—Defendant, City of Milwaukee, the Sewerage Commission of the City of Milwaukee and Metropolitan Sewerage Commission of the County of Milwaukee's Notice of Appeal from the order entered September 27, 1976 in favor of plaintiffs. msn

10/27/53—Defendants' Motion to Delay the January 3, 1977 trial date in light of this court's order dated October 20, 1976. msn

10/29/76—Order dated October 28, 1976: Pursuant to the court's Memorandum Opinion dated September 22, 1976, defendants' motion to dismiss, motion for joinder, motion for class action status and motion for complex litigation status are all denied. Defendants' motion to postpone the trial date until completion of the study of the Environmental Protection Agency is also denied. Defendants' motion for certification of these questions under 28 USC § 1292(b) is also denied.—Grady, J.

11/2/76—Defendants' Notice of Motion and Motion to Limit Discovery. msn

11/3/76—Order dated November 3, 1976: Defendant's motion to delay the January 3, 1977 trial date in light of this court's order dated October 20, 1976 is denied.—Grady, J.

11/8/76—Plaintiff's Memorandum of Law in Support of Motion to Strike.

11/8/76—Defendants' Memorandum in Support of Motion to Limit Discovery and Affidavit of Mailing.

11/9/76—Defendants' Notice of Appeal from the order entered on the 28th day of October.

11/19/76—Order dated November 17, 1976: Certain documents shall be produced for inspection and copying no later than December 11, 1976; both sides to make all witnesses available for deposition no later than December 20, 1976; all parties shall have indicated any objections to the authenticity of documents by December 22, 1976. Cause is continued for status report to December 29, 1976 at 2 p.m.—Grady, J.

11/22/76—Defendant, The Sewerage Commission of the City of Milwaukee's Supplemental Answer to Interrogatories of Plaintiff, State of Illinois.

11/22/76—Supplemental Answers to First Set of Interrogatories of Plaintiff, State of Illinois.

11/22/76—Supplemental Answers to Plaintiff's First Set of Interrogatories Directed to Defendant City of Milwaukee, Wisconsin.

12/8/76—Filed Motion to Compel Further Production of Documents.

12/10/76—Order dated December 8, 1976: Motion of plaintiff to compel further production of documents is granted. Counsel for plaintiff to prepare and submit a draft order.—Grady, J.

12/27/76—Certified copy of order from USCA denying the petition for writ of mandamus.

12/30/76—Order dated December 29, 1976: By Friday, December 31, 1976, each side is to submit to the other side the names and addresses of all witnesses they intend to have testify in their respective cases in chief. This cause is set down for trial on Monday, January 10, 1977 at 10 a.m.—Grady, J.

1/3/77—Filed defendants' Metropolitan Sewerage Commission of the County of Milwaukee and the Sewerage Commission of the City of Milwaukees' Witness List.

1/4/77—Certified copy of USCA order: It is further ordered that this appeal be dismissed by stipulation with each party to bear its own costs.

1/4/77—Received record, USCA, consisting of three volumes of pleadings.

1/5/77—Defendants' Exhibits (list of documents).

1/12/77—Order dated January 11, 1977: Cause is called for trial by the Court. Motion is submitted by defendants. Item 1 of defendant's motion granted; item 2 granted, items 3 and 4 denied, as to items 5 and 6, the Court reserves its ruling; item 7 denied; item 8 is granted. Motion by plaintiff to dismiss defendant City of South Milwaukee, Wisconsin granted. Opening

statements heard and concluded. Evidence presented for plaintiffs in part. Trial is adjourned to January 13, 1977 at 10 a.m.—Grady, J.

1/14/77—Order dated January 13, 1977: Trial is resumed. Over objections the Court grants the motion of plaintiff to dismiss the defendant City of Milwaukee as a defendant in this action, with prejudice. Further evidence presented for the plaintiff in part. Trial is adjourned to Friday, January 14, 1977 at 10 a.m.—Grady, J.

1/19/77—Order dated January 17, 1977: Trial is resumed. Further evidence for the plaintiff in part, and the trial is adjourned to January 18, 1977 at 10 a.m.—Grady, J.

1/19/77—Order dated January 18, 1977: Trial is resumed. Further evidence for the plaintiff in part. Trial is adjourned to January 18, 1977 at 10 a.m.—Grady, J.

1/21/77—Order dated January 20, 1977: Trial is resumed. Further evidence for the plaintiff in part. Trial is adjourned until Friday, January 21, 1977 at 10 a.m.

1/24/77—Order dated January 21, 1977: Trial resumed. Further evidence for the Plaintiff in part. Trial is adjourned to January 24, 1977 at 10 a.m.—Grady, J.

1/26/77—Order dated January 24, 1977: Trial is resumed. Further evidence for the plaintiff, in part. Trial is adjourned until January 25, 1977 at 10 a.m.—Grady, J.

1/26/77—Order dated January 25, 1977: Trial is resumed. Further evidence for the plaintiff, in part. Trial is adjourned to Thursday, January 27, 1977 at 10 a.m.—Grady, J.

1/31/77—Order dated January 27, 1977: Trial resumed. Further evidence for the plaintiff in part. Trial is adjourned until January 28, 1977 at 10 a.m.—Grady, J.

1/31/77—Order dated January 28, 1977: Trial resumed. Further evidence for the plaintiff in part. Trial is ad-

journed until Tuesday, February 1, 1977 at 10 a.m.—Grady, J.

2/7/77—Order dated February 1, 1977: Trial is resumed. Further evidence for the plaintiff in part. Trial is adjourned with Thursday, February 3, 1977 at 9:30 a.m. —Leighton, J.

2/7/77—Order dated February 3, 1977: Trial is resumed. Further evidence for the plaintiff in part. Trial is adjourned to Friday, February 4, 1977 at 9:30 a.m.—Leighton, J.

2/7/77—Order dater February 4, 1977: Trial is resumed. Further evidence for the plaintiff in part. Trial is adjourned untl Monday, February 7, 1977 at 9:30 a.m. —Leighton, J.

2/14/77—Order dated February 7, 1977: Trial is resumed. Further evidence for plaintiff in part. Trial adjourned to February 8, 1977 at 10 a.m.—Grady, J.

2/14/77—Order dated February 10, 1977: Trial is resumed. Further Evidence for the plaintiff in part. Trial is adjourned until Friday, February 11, 1977 at 10:30 a.m. —Grady, J.

2/16/77—Order dated February 11, 1977: Trial is resumed. Further evidence for the plaintiff in part. Trial is adjourned until Monday, February 14, 1977 at 9:30—Grady, J.

2/16/77—Order dated February 14, 1977: Because of illness of one of the plaintiff's attorneys, trial is continued until Tuesday, February 15, 1977 at 10 a.m.—Grady, J.

2/16/77—Order dated February 15, 1977: Trial is resumed. Further evidence for the plaintiff in part. The trial is adjourned until February 16, 1977 at 9:30 a.m.—Grady, J.

2/17/77—Order dated February 16, 1977: Trial is resumed. Further evidence for the plaintiff in part. Trial is adjourned until February 17, 1977 at 10 a.m.—Grady, J.

2/22/77—Order dated February 17, 1977: Trial is resumed. Further evidence presented for the plaintiff and the plaintiff rests. Evidence presented for the defendants in part. The trial is adjourned until February 23, 1977 at 10 a.m.—Grady, J.

2/28/77—Order dated February 24, 1977: Trial is resumed. Further evidence for the defendants in part. Trial adjourned to Friday, February 25, 1977 at 9:30 a.m. —Grady, J.

2/28/77—Order dated February 23, 1977: Trial is resumed. Further evidence for the defendant in part. Trial is adjourned to Thursday, February 24, 1977 at 9:30 a.m. Grady, J.

2/28/77—Order dated February 25, 1977: Trial is resumed. Further evidence for the defendant in part. Trial is hereby adjourned until March 7, 1977 at 10 a.m.— Grady, J.

3/9/77—Order dated March 7, 1977: Trial is resumed. Further evidence for the defendants in part. Trial is adjourned until Tuesday, March 8, 1977 at 10 a.m.— Grady, J.

3/9/77—Order dated March 8, 1977: Trial is resumed. Further evidence presented for the defendants in part. Trial is adjourned until Wednesday, March 9, 1977 at 10 a.m.—Grady, J.

3/9/77—Metropolitan Milwaukee Association of Commerce's Motion to Suspend Rule 7 of the Rules of the Court.

3/10/77—Order dated March 9, 1977: Leave is granted Metropolitan Milwaukee Assoc. of Commerce to file a

brief as Amicus Curiae on March 30, 1977. Motion for Amicus Curiae to suspend Rule 7 of the Rules of this court, granted.—Grady, J.

3/9/77—Order dated March 9, 1977: Trial is resumed. Further evidence for the defendants in part and trial is adjourned until Thursday March 10, 1977 at 9:30 a.m.—Grady, J.

3/14/77—Order dated March 10, 1977: Trial is resumed. Further evidence for the defendants in part and trial is adjourned to Friday March 11, 1977 at 10 a.m.—Grady, J.

3/14/77—Order dated March 11, 1977: Trial is resumed. Further evidence for the defendants in part and trial is adjourned to Monday March 14, 1977 at 10 a.m.—Grady, J.

3/16/77—Order dated March 14, 1977: Trial is resumed. Further evidence presented for the defendants in part. Trial is adjourned until Tuesday, March 15, 1977 at 10 a.m.—Grady, J.

3/16/77—Order dated March 15, 1977: Trial is resumed. Further evidence for the defendants in part. Trial is adjourned until Wednesday, March 16, 1977 at 9:30 a.m.—Grady, J.

3/18/77—Order dated March 17, 1977: Trial is resumed. Further evidence for the defendants in part: Trial is adjourned to Friday, March 18, 1977 at 9 a.m.—Grady, J.

3/18/77—Order dated March 16, 1977: Trial resumed. Further evidence presented for the defendants in part and the trial is adjourned until Thursday, March 17, 1977 at 10 a.m.—Grady, J.

3/22/77—Order dated March 18, 1977: Trial is resumed. Further evidence for the defendants in part: Trial is

adjourned to Monday, March 21, 1977 at 10 a.m.—Grady, J.

3/21/77—Order dated March 21, 1977: Trial is resumed. Further evidence for the defendants in part. Trial is adjourned until Tuesday, March 22, 1977 at 10 a.m.—Grady, J.

3/22/77—Order dated March 22, 1977: Trial is resumed. Further evidence presented for the defendants in part and the trial is adjourned until March 23, 1977 at 9:30 a.m.—Grady, J.

3/22/77—Motion to Quash Portion of Subpoena Served on Dr. Robert Agnew.

3/22/77—Order dated March 22, 1977: Motion of the government to quash portion of subpoena served on Dr. Robert Agnew is entered and continued generally.—Grady, J.

3/24/77—Order dated March 23, 1977: Leave granted to Citizens for a Better Environment and the Milwaukee River Restoration Council to file a short brief as amicus curiae. Motion to suspend Rule 7 of the rules of this court, granted.—Grady, J.

3/24/77—Order dated March 23, 1977: Trial is resumed. Further evidence for the defendants in part and the trial is adjourned to Thursday, March 24, 1977 at 10 a.m.—Grady, J.

3/28/77—Order dated March 24, 1977: Trial is resumed. Further evidence for the defendants in part and the trial is adjourned until Friday, March 25, 1977 at 10 a.m.—Grady, J.

3/28/77—Order dated March 25, 1977: Motion of the Federal Highway Administration, Dept of Transportation to quash a portion of a subpoena served on Dr. Robert Agnew, denied.—Grady, J.

3/31/77—Order dated March 25, 1977: Trial resumed, further evidence for the defendants in part. Trial is adjourned until Monday, March 28, 1977 at 9:30 a.m.—Grady, J.

3/31/77—Order dated March 28, 1977: Trial is resumed. Further evidence for the defendants in part. Trial is adjourned until March 29, 1977 at 10 a.m.—Grady, J.

3/31/77—Order dated March 29, 1977: Trial is resumed. Further evidence presented for the defendants in part. Trial is adjourned until Thursday, March 31, 1977 at 9:30 a.m.—Grady, J.

4/4/77—Order dated March 31, 1977: Trial resumed, further evidence for the defendants in part. Trial is adjourned until Friday, April 1, 1977 at 9:30 a.m.—Grady, J.

4/4/77—Order dated April 1, 1977: Trial is resumed. Further evidence presented by the defendants in part. Trial is hereby adjourned until May 23, 1977 at 10 a.m.—Grady, J.

5/25/77—Order dated May 23, 1977: Trial resumed. Further evidence for the defendants in part. Trial is adjourned until May 24, 1977 at 10 a.m.—Grady, J.

5/25/77—Order dated May 24, 1977: Trial resumed. Further evidence for the defendants in part. Trial is adjourned until May 26, 1977 at 9:30 a.m.—Grady, J.

5/27/77—Order dated May 26, 1977: Trial is resumed. Further evidence is presented by the defendants in part. Trial is adjourned until Friday, May 27, 1977 at 9:30 a.m.—Grady, J.

6/1/77—Order dated 5/27/77: Trial resumed. Further evidence for the defendants in part. Trial is adjourned until Tuesday, May 31, 1977 at 10:00 am. Grady, J.

5/31/77—Defendant's, Sewerage Commission of the City of Milwaukee and Metropolitan Sewerage Commission of the County of Milwaukee, Motion to dismiss; Affidavit of Ewald L. Moerke, Jr. with attachments.

6/2/77—Order dated 5/31/77: Trial is resumed. Motion of Sewerage Commission, Metropolitan Sewerage Commission and the City of Milwaukee, to dismiss the above-captioned action now on trial is denied. Further evidence presented for the defendants in part. Trial is adjourned until Wednesday, June 1, 1977 at 9:30 am. Grady, J.

6/3/77—Order dated 6/1/77: Trial is resumed. Further evidence is presented by the defendants in part. Trial is adjourned until June 2, 1977 at 9:30 am. Grady, J.

6/3/77—Order dated 6/2/77: Trial resumed. Further evidence is presented for the defendants in part. Trial is adjourned until Monday, June 27, 1977 at 10:00 am. Grady, J.

6/22/77—Plaintiff's motion to compel attendance of witnesses at deposition.

6/23/77—Order dated 6/22/77: The Court orders certain depositions to be taken. Cause taken off the trial call on Monday, June 27, 1977. Grady, J.

6/24/77—Order dated 6/23/77: Ordered that the trial in this cause is set to resume on Tuesday, June 28, 1977 at 9:30 am. Grady, J.

6/29/77—Order dated 6/28/77: Trial resumed. Further evidence presented for the defendants in part. Trial is adjourned until Wednesday 29, 1977 at 10:00 am. Grady, J.

6/30/77—Order dated 6/29/77: Trial resumed, Further evidence for defendants in part. Trial adjourned until Thursday, June 30, 1977 at 10:30 am. Grady, J.

7/5/77—Order dated 6/30/77: Trial resumed, further evidence for the defendants in part. Trial is adjourned until Friday, July 1, 1977 at 1:30 am. Grady, J.

7/6/77—Order dated 7/1/77: Trial resumed, further evidence for defendants and the trial is adjourned until July 5, 1977 at 10:00 am. Grady, J.

7/6/77—Order dated 7/5/77: Trial resumed further evidence for the defendants in part. Trial adjourned to Wednesday, July 6, 1977 at 9:30 am. Grady, J.

7/7/77—Order dated 7/6/77: Trial is resumed further evidence for the defendants in part. Trial is adjourned to Thursday, July 7, 1977 at 9:30 am. Grady, J.

7/8/77—Order dated 7/7/77: Trial resumed, further evidence for the defendants, in part. Trial adjourned until Friday, July 3, 1977 at 9:30 am. Grady, J.

7/11/77—Order dated 7/8/77: Trial resumed, further evidence for the defendant. Trial adjourned until Monday, July 11, 1977 at 9:30 am. Grady, J.

7/12/77—Order dated 7/11/77: Trial resumed. Further evidence for the defendants and the defendants rest. Rebuttal evidence for the Plaintiff in part. Trial adjourned until Tuesday, July 12, 1977 at 10:00 am. Grady, J.

7/14/77—Order dated 7/12/77: Trial resumed. Further rebuttal evidence. Trial adjourned until Thursday, July 14, 1977 at 9:30 am. Grady, J.

7/18/77—Order dated 7/14/77: Trial held. Further rebuttal evidence presented. Trial adjourned until Friday, July 15, 1977 at 9:30 am. Grady, J.

7/19/77—Order dated 7/15/77: Trial held. Further rebuttal evidence presented. Trial is adjourned to Monday, July 18, 1977 at 9:30 am. Grady, J.

7/20/77—Order dated 7/18/77: Trial held. Further rebuttal evidence presented. Trial is adjourned to July 19, 1977 at 10:00 am. Grady, J.

7/20/77—Order dated 7/19/77: Trial is not held. Trial continued to Wednesday, July 20, 1977 at 10:00 am. Grady, J.

7/22/77—Order dated 7/20/77: Trial held. Rebuttal evidence concluded. Trial conference re evidence set on July 21, 1977 at 3:00 pm. Grady, J.

7/22/77—Order dated 7/21/77: Trial conference re evidence held. Cause is continued for final arguments to Monday, July 25, 1977 at 9:30 am. Grady, J.

7-27-77—Order dated July 25, 1977: Trial held. Final arguments in part. Trial adjourned until July 26, 1977 at 9:30 am. Grady, J.

7-27-77—Order dated July 26, 1977: Trial held. Final arguments concluded. Cause taken under advisement for decision on Friday, July 29, 1977 at 10:00 am. Grady, J.

8/2/77—Order dated 7/29/77: Trial concluded. The Court finds in favor of the plaintiffs and against the defendants on the issue of liability as to the three (3) counts of the complaint. Counsel for the plaintiffs to prepare and to submit by September 9, 1977 a judgment order for entry. Grady, J.

8/30/77—Order dated 8/29/77: Enter findings of fact and conclusions of Law (Draft) Grady, J.

9/12/77—Order dated 9/9/77: Motion by defendants amending the findings of fact and conclusions of law etc. denied. Depositions to commence the week of October 10, 1977 and are to end the week of November 1, 1977. Evidentiary hearing set on November 14, 1977 at 10:00 am. Grady, J.

9/9/77—Defendant's, City of Milwaukee, Notice of motion and motion to amend;

9/9/77—Defendant's, City of Milwaukee, compliance schedule

9/9/77—Defendant's, Sewerage Commission City of Milwaukee, schedule of compliance with attachments

9/21/77—Plaintiff's request for production of documents

9/21/77—Plaintiff's motion to advance the date for defendants' response to plaintiff's request for production of documents

9/22/77—Order dated 9/21/77: The time for compliance with plaintiff's request for production of documents will be shortened to October 3, 1977 and the plaintiff shall have until October 3, 1977 to furnish documents requested by defendant. Grady, J.

10/3/77—Defendants, D5&6, partial response to Plaintiff's document production request

10/3/77—Defendants' D5&6, Defendant Sewerage Commissions' request for production of documents

10-3-77—Plaintiff's response to defendant Sewerage Commissions' request for production of documents.

10-3-77—Defendants Sewerage Commission of the City of Milwaukee and Metropolitan Sewerage Commission's second partial response to plaintiff's documents production request.

10-3-77—Defendants Sewerage Commission of the City of Milwaukee and Metropolitan Sewerage Commission's third partial response to plaintiff's documents production request.

11/16/77—Order dated 11/14/77: Evidentiary hearing not held. Hearing held on the proposed judgment order. Draft judgment order to be submitted for entry. Grady, J.

11/16/77—Order dated 11/15/77: Enter judgment order (See Draft) Grady, J.

11/16/77—Rule 58 judgment dated 11/15/77

1/13/78—Defendants' Sewerage and Metropolitan, letter dated 1/12/78 re additional exhibits

7-5-79—Opinion No. 77-2246 of USCA dated 6-29-79.

7-5-79—Certified copy of Judgment order from the U.S. C.A., 7th Cir. dated April 26, 1979/ . . . It is ordered and adjudged by this court that the judgment of the said District Court in this cause appealed from be, and the same is hereby AFFIRMED in part, REVERSED and Remanded in part, in accordance with the order of this court entered, and the opinion of this court filed this date.

11-16-79—Order dated November 15, 1979; Plaintiff has not commented in writing on the proposed modified judgment order submitted by defendant. Plaintiff may do so by November 28, 1979, suggesting alternate language for any provision with which it disagrees. Defendant may reply by December 7, 1979 (draft)—GRADY, J.

11-30-79—Plaintiff State of Illinois' 11-28-79 response to court order of November 15, 1979.

12-6-79—Defendants The Sewerage Commission of the City of Milwaukee and the Metropolitan Sewerage Commission of the County of Milwaukee and City of Milwaukees' 11-28-79 notice of filing; motion for modification of judgment order; affidavit in support of motion for modification of judgment order; affidavit in support of motion for modification of judgment order.

12-6-79—Order dated December 5, 1979; Modified judgment order to be entered at a later date. Hearing set for Thursday, January 31, 1980 at 10 a.m.

12-11-79—Defendants' 12-10-79 reply to "Illinois" response to court order of November 15, 1979.

12-11-79—Intervening plaintiff State of Michigan's 12-10-79 response to court order of November 15, 1979; attachments.

1-8-80—Order dated 1-3-80: Plaintiff may submit its version of the amended judgment order, the order is to be submitted no later than January 14, 1980. (DRAFT).

2-1-80—Order dated January 31, 1980: Hearing held on Amended Judgment order and on Supplement # 1 to the Judgment order. (DRAFT) Enter Amended Judgment Order (DRAFT) Enter Supplement # 1 to the Judgment order. (DRAFT) (2 DRAFTS)—GRADY, J.

2-28-80—Notice of appeal by defendants City of Milwaukee, the Sewerage Commission of the City of Milwaukee and the Metropolitan Sewerage Commission of the County of Milwaukee.

3/13/80—Notice of Cross-Appeal by Plaintiff from the Amended Judgment Order entered 1/31/80.

10-11-79—Order dated 10-10-79: Enter Motion by certain defendants to modify judgment order. Defendants Memorandum to be filed on October 22, 1979. Plaintiffs response to be filed on November 1st, 1979; reply to response due to be filed on November 8, 1979. The Motion will then be taken under advisement. GRADY, J.

3-27-80—Certified and transmitted record on appeal in one volume consisting of documents filed on 7-5-79 through and including 3-27-80.

1-31-80—Amended Judgment Order.

2-27-80—Defendants' Notice of Appeal to USCA from Amended Judgment Order.

3-12-80—Plaintiff's Notice of Cross-Appeal to USCA from Amended Judgment Order.

4-3-80—Defendants' Application to USCA for Stay Pending Certiorari.

4-8-80—Order: USCA stays defendants' appeal and plaintiff's cross-appeal pending certiorari.

4-16-80—Order: USCA determines it lacks jurisdiction to stay effect of judgments, decrees and orders of it and USDC pending certiorari.

4-24-80—Defendants' Application to U.S. Supreme Court for Stay Pending Certiorari.

5-8-80—Order: Stay Pending Certiorari granted. Stevens, J.

Complaint of State of Illinois

UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

No. 72C-1253

PEOPLE OF THE STATE OF ILLINOIS ex rel. WILLIAM J. SCOTT, Attorney General of the State of Illinois, *Plaintiff*,

v.

CITY OF MILWAUKEE, WISCONSIN, a municipality incorporated under the laws of the State of Wisconsin, and a political subdivision thereof, and

CITY OF KENOSHA, WISCONSIN, a municipality incorporated under the laws of the State of Wisconsin, and a political subdivision thereof, and

CITY OF RACINE, WISCONSIN, a municipality incorporated under the laws of the State of Wisconsin, and a political subdivision thereof, and

CITY OF SOUTH MILWAUKEE, WISCONSIN, a municipality incorporated under the laws of the State of Wisconsin, and a political subdivision thereof, and

THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE, a municipality existing under the laws of the State of Wisconsin, and a political subdivision thereof, and

THE METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE, a municipality incorporated under the laws of the State of Wisconsin, and a political subdivision thereof, *Defendants*.

COMPLAINT

NOW COMES plaintiff, THE PEOPLE OF THE STATE OF ILLINOIS ex rel. WILLIAM J. SCOTT, Attorney General of the

State of Illinois, and complaining of defendants, CITY OF MILWAUKEE, WISCONSIN, CITY OF KENOSHA, WISCONSIN, CITY OF RACINE, WISCONSIN, CITY OF SOUTH MILWAUKEE, WISCONSIN, THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE, and THE METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE, alleges as follows:

Count I

1. This Count arises under the Constitution and laws of the United States. The matter in controversy exceeds the sum or value of $10,000.00, exclusive of interest and costs. This Court has jurisdicton of the count by virtue of 28 U.S.C. § 1331, as is set out more fully in the opinion of the United States Supreme Court in *Illinois* v. *City of Milwaukee, Wisconsin,* No. 49 Original, April 24, 1972, a copy of which opinion is attached hereto as Exhibit A [omitted], and is made a part hereof.

2. Plaintiff, PEOPLE OF THE STATE OF ILLINOIS ex rel. WILLIAM J. SCOTT, Attorney General of the State of Illinois, is a sovereign State of these United States, comprised of more than 11 million residents as of the 1970 United States census. Plaintiff is vitally concerned with matters of environmental quality affecting its air, land, and water, and in this regard has enacted comprehensive environmental legislation (Illinois Environmental Protection Act of 1970, Ill. Rev. Stat. 1971, Ch. 111-1/2, § 1001 et seq.), which legislation includes concern over pollution of the waters of the State of Illinois whether such pollution occurs as a result of discharges within or without Illinois and prohibits such discharges. The relator, WILLIAM J. SCOTT, Attorney General of the State of Illinois, is the duly elected, qualified and acting Attorney General of the State of Illinois, and is the chief legal officer for the plaintiff and in that capacity is empowered to bring, and does bring, this suit on behalf of plaintiff.

3. The defendants, CITY OF MILWAUKEE, WISCONSIN, CITY OF KENOSHA, WISCONSIN, CITY OF RACINE, WISCONSIN, CITY OF SOUTH MILWAUKEE, WISCONSIN, SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE, and METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE, are municipalities, incorporated under the laws of the State of Wisconsin, political subdivisions thereof and hence citizens of that State. The defendant Sewerage Commission of the City of Milwaukee is charged by it with the duty of collecting, transmitting, and disposing of the City's sewage, while the defendant Metropolitan Sewerage Commission of the County of Milwaukee has the responsibility for the transmission, treatment, and disposal of sewage from territory located within its drainage area.

4. At all times pertinent to this complaint, the State of Illinois has been and now is the owner in trust, for the benefit of its citizens, of the waters of Lake Michigan within the State's territorial boundaries, and the protector and guardian of these waters for the use, needs, and enjoyment of its citizens and inhabitants, along the Illinois shore from the Wisconsin-Illinois boundary to the Indiana-Illinois boundary.

5. From ancient geological periods, Lake Michigan has been and now is a natural body of fresh water. It is bordered by the States of Illinois, Wisconsin, Michigan, and Indiana. Frequently, natural currents and atmospheric conditions cause the waters of Lake Michigan to flow north to south along the shoreline of Lake Michigan from a point north of the City of Milwaukee, past the cities of Milwaukee, South Milwaukee, Racine, and Kenosha, Wisconsin, past the Wisconsin-Illinois boundary and along the Illinois shore, and thence southerly and easterly past the Indiana-Illinois boundary and along the Indiana shore. Lake Michigan has been and is now a vital source of public water supply for many municipalities, citizens, and inhabitants of the State of Illinois, and has been and is now used as a

place of recreation, relaxation, and enjoyment by numerous citizens and inhabitants of the State of Illinois.

6. The defendant municipalities and political subdivisions of the State of Wisconsin are located in the State of Wisconsin at and near the shoreline of Lake Michigan, as is demonstrated by Exhibit B [omitted], attached to this complaint and made a part hereof. The defendant municipalities and political subdivisions of the State of Wisconsin are now authorizing, causing, permitting, or allowing, and have for a long time heretofore authorized, caused, permitted, or allowed, the discharge of matter and effluents into Lake Michigan, consisting of untreated raw sewage or improperly or inadequately treated sewage, which sewage originates from or within the defendants' respective cities or sanitary sewerage systems, all controlled and operated by the defendant municipalities, their employers, servants, or agents. These matters and effluents discharged into the waters of Lake Michigan are contaminants which cause serious and substantial deterioration in the quality of Lake Michigan waters within the territorial boundaries of the State of Illinois.

7. Said deterioration includes a lessening in the quality of Illinois' Lake Michigan waters as a source of drinking water, body-contact recreation, sailing, fishing, and other legitimate uses of Lake Michigan by the PEOPLE OF THE STATE OF ILLINOIS.

8. The above-described damage to the Lake Michigan territorial waters of the State of Illinois is based upon the following factors:

(a) The sewage and contaminants discharged by or with the consent of the defendant municipalities and political subdivisions of the State of Wisconsin into Lake Michigan frequently are carried by the flow of the waters, natural currents, and atmospheric conditions southward past the Wisconsin-Illinois boundary

and into Illinois territorial waters. The sewage and contaminants thus carried into Lake Michigan territorial waters of Illinois have the above-described damaging effects on Illinois waters. Furthermore, said sewage and contaminants thus carried into Lake Michigan territorial waters of Illinois contain viruses, pathogens, and various types of bacilli which are harmful to human beings and animals, and which can cause organic malfunction and disease in the human body and in animal bodies; hence, they constitute a severe danger to the health, safety, and welfare of the citizens and inhabitants of the State of Illinois, who make use or attempt to make use of the waters of Lake Michigan within the boundaries of Illinois.

(b) The Lake Michigan territorial waters of Illinois and Wisconsin share a mutual aquatic ecology. Damage to aquatic organisms and to water quality in the Wisconsin territorial waters of Lake Michigan will result in a corresponding damaging impact on aquatic organisms and water quality in the Illinois territorial waters of Lake Michigan.

9. The defendant municipalities and political subdivisions of the State of Wisconsin, and each of them, owe a duty to riparian land owners and water users and to the PEOPLE OF THE STATE OF ILLINOIS not to pollute Lake Michigan in the manner heretofore described and owe a further duty to preserve the water quality and ecology of Lake Michigan so as not to endanger the health, safety, and welfare of the citizens and inhabitants of the State of Illinois.

10. The defendant municipalities and political subdivisions of the State of Wisconsin have failed and continue to fail to use proper and approved methods and practices to adequately and properly treat and dispose of the sewage emanating from their localities or originating in the sewer-

age works owned or operated by them; they have thereby neglected to exercise due and proper care and diligence in conducting and carrying out their municipal responsibilities and have thus injuriously affected the rights and legal interests of the citizens and inhabitants of the State of of Illinois.

11. Notwithstanding the fact that the defendant municipalities and political subdivisions of the State of Wisconsin have been repeatedly urged to improve their sewerage systems and to halt the discharge of sewage and contaminants into the waters of Lake Michigan, they have until now failed to do so.

12. The discharge of the sewage and contaminants by defendants into the waters of Lake Michigan, and the consequent carrying of that sewage and contaminants by the natural flow and currents and atmospheric conditions into Illinois territorial waters, and particularly into the waters adjacent to the Illinois shore, causes and constitutes a public nuisance, injuriously affecting the health, safety, and welfare of the citizens and inhabitants of the State of Illinois.

13. To the best of plaintiff's knowledge and belief, the defendant municipalities and political subdivisions of the State of Wisconsin continue and will continue the wrongful act of discharging sewage and contaminants into Lake Michigan unless restrained and enjoined by order of court. Plaintiff has no adequate remedy save that afforded by a court of equity. The injuries to Lake Michigan and to the citizens and inhabitants of Illinois are irreparable, and only an order of this Court can lead to the elimination, or at least the minimizing, of the injuries to plaintiff.

WHEREFORE, plaintiff prays that the Court grant the following relief:

(a) That the Court permanently restrain defendants, and each of them, from discharging raw sewage, or

inadequately or improperly treated sewage, into the waters of Lake Michigan;

(b) That the Court order such further relief as equity may require and as the Court may deem proper or appropriate; and

(c) That the Court tax and assess all costs, including expert witness fees, and scientific study and research costs, against defendants.

Count II

1. This count is brought by the relator, WILLIAM J. SCOTT, Attorney General of the State of Illinois, for and on behalf of the PEOPLE OF THE STATE OF ILLINOIS, pursuant to the terms and provisions of the Illinois "Environmental Protection Act," (*Public Act 76-2429*), approved June 29, 1970, Ill. Rev. Stat. 1971, Ch. 111 ½, § 1001 *et seq.*, wherein and whereby he is empowered to bring actions to enforce the provisions of the aforesaid Act by injunction or recovery of penalties in a civil action, or by both injunction or recovery of penalties.

2.-8. As paragraphs 2 through 8 of Count II, the PEOPLE OF THE STATE OF ILLINOIS incorporate by reference and allege as though fully set forth herein the allegations of paragraphs 2 through 8 of Count II [sic].

9. The discharge into Lake Michigan waters of sewage and contaminants by defendants and the resultant injury to Illinois territorial waters of Lake Michigan described above constitutes "water pollution" as defined in the Illinois Environmental Protection Act, Ill. Rev. Stat. 1971, Ch. 111 ½, § 1003(n), in that said discharge:

". . . is such alteration of the physical, thermal, chemical, biological or radioactive properties of any waters of the State, or such discharge of any contami-

nant into any waters of the State, as will or is likely to create a nuisance or render such waters harmful or detrimental or injurious to public health, safety or welfare, or to domestic, commercial, industrial, agricultural, recreational, or other legitimate uses, or to livestock, wild animals, birds, fish, or other aquatic life."

10. By causing water pollution in Illinois waters, defendants are in violation of Section 12(a) of the Illinois Environmental Protection Act, Ill. Rev. Stat. 1971, Ch. 111 ½, § 1012(a).

11. Under Section 42 of the Illinois Environmental Protection Act, persons violating the Act by causing water pollution of Illinois waters may be enjoined from continuing such violations upon an action for injunctive relief brought by the Attorney General. Ill. Rev. Stat. 1971, Ch. 111 ½, § 1042.

12. The relator, WILLIAM J. SCOTT, has reason to believe and fears that, unless restrained by order of this Court, defendants will continue to cause, permit or allow raw sewage, or inadequately or improperly treated sewage to be discharged into the waters of Lake Michigan, and that thereby defendants will continue to cause water pollution of the Illinois territorial waters of Lake Michigan.

13. The PEOPLE OF THE STATE OF ILLINOIS are without remedy, save in a court of equity.

WHEREFORE, plaintiff prays that the Court grant the following relief:

(a) That the Court permanently restrain defendants, and each of them, from discharging raw sewage, or inadequately or improperly treated sewage, into the waters of Lake Michigan;

(b) That the Court order such further relief as equity may require and as the Court may deem proper or appropriate; and

(c) That the Court tax and assess all costs, including expert witness fees, and scientific study and research costs, against defendants.

Count III

1. This count is brought by the relator, WILLIAM J. SCOTT, Attorney General of the State of Illinois, for and on behalf of the PEOPLE OF THE STATE OF ILLINOIS, pursuant to the Attorney General's common-law power to seek abatement of a public nuisance by means of a court-imposed injunctive order.

2.-8. As paragraphs 2 through 8 of Count III, the PEOPLE OF THE STATE OF ILLINOIS incorporate by reference and allege as though fully set forth herein the allegations of paragraphs 2 through 8 of Count I.

9. The activities of defendants, in permitting, allowing or causing the discharge of raw sewage, or inadequately or improperly treated sewage, into the waters of Lake Michigan in such a manner as to cause the substantial injuries to the Lake Michigan territorial waters of Illinois, as described above, constitute a public nuisance under the common law of Illinois.

10. The PEOPLE OF THE STATE OF ILLINOIS are without remedy, save in a Court of equity.

WHEREFORE, plaintiff prays that the Court grant the following relief:

(a) That the Court permanently restrain defendants, and each of them, from discharging raw sewage, or inadequately or improperly treated sewage, into the waters of Lake Michigan;

(b) That the Court order such further relief as equity may require and as the Court may deem proper or appropriate; and

(c) That the Court tax and assess all costs, including expert witness fees, and scientific study and research costs, against defendants.

/s/ WILLIAM J. SCOTT
William J. Scott
Attorney General
State of Illinois

OF COUNSEL:
DAVID C. LANDGRAF, Chief
Environmental Control Division

—and—

HARVEY M. SHELDON, Chief
Northern Region
Environmental Control Division

188 West Randolph Street
Suite 2315
Chicago, Illinois 60601
(312) 793-2491

Complaint of State of Michigan

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

No. 72C-1253

PEOPLE OF THE STATE OF ILLINOIS, ex rel. WILLIAM J. SCOTT, Attorney General of the State of Illinois, *Plaintiff*,

PEOPLE OF THE STATE OF MICHIGAN, *Intervening Plaintiff*,

vs.

CITY OF MILWAUKEE, WISCONSIN, a municipality incorporated under the laws of the State of Wisconsin, and a political subdivision thereof, and

CITY OF KENOSHA, WISCONSIN, a municipality incorporated under the laws of the State of Wisconsin, and a political subdivision thereof, and

CITY OF RACINE, WISCONSIN, a municipality incorporated under the laws of the State of Wisconsin, and a political subdivision thereof, and

CITY OF SOUTH MILWAUKEE, WISCONSIN, a municipality incorporated under the laws of the State of Wisconsin, and a political subdivision thereof, and

THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE, a municipality existing under the laws of the State of Wisconsin, and a political subdivision thereof, and

THE METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE, a municipality incorporated under the laws of the State of Wisconsin, and a political subdivision thereof, *Defendants*.

COMPLAINT

NOW COMES THE PEOPLE OF THE STATE OF MICHIGAN, intervening plaintiff, by their attorney, FRANK J. KELLEY, Attor-

ney General of the State of Michigan and complaining of defendants, CITY OF MILWAUKEE, WISCONSIN, CITY OF KENOSHA, WISCONSIN, CITY OF RACINE, WISCONSIN, CITY OF SOUTH MILWAUKEE, WISCONSIN, THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE, and THE METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE, alleges as follows:

Jurisdiction

1. This matter arises under the Constitution and laws of the United States. The matter in controversy exceeds the sum or value of $10,000, exclusive of interests and costs. This Court has jurisdiction of the matter by virtue of 28 USC 1331.

The Parties

2. Intervening plaintiff, the PEOPLE OF THE STATE OF MICHIGAN, is a sovereign state of these United States, comprised of more than 8,875,000 residents as of the 1970 census. Intervening plaintiff is vitally concerned with matters of environmental quality affecting its air, land, and water, and in this regard has enacted comprehensive legislation. The Michigan Water Resources Commission Act, being MCLA 323.1 et seq, MSA 3.521 et seq and the Michigan Water Pollution Control Act of 1970, being MCLA 323.331 et seq, MSA 3.533(201) et seq for example, expresses the concern by the State of Michigan over the pollution of its waters. FRANK J. KELLEY, Attorney General of the State of Michigan, is the chief legal officer for the intervening plaintiff, and in that capacity is empowered to bring, and does bring, this suit on behalf of the intervening plaintiff.

3. The defendants, CITY OF MILWAUKEE, WISCONSIN, CITY OF KENOSHA, WISCONSIN, CITY OF RACINE, WISCONSIN, CITY OF SOUTH MILWAUKEE, WISCONSIN, SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE, and METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE, are municipali-

ties, incorporated under the laws of the State of Wisconsin, political subdivisions thereof and hence citizens of that State. The defendant Sewerage Commission of the City of Milwaukee is charged by law with the duty of collecting, transmitting, and disposing of the City's sewage, while the defendant Metropolitan Sewerage Commission of the County of Milwaukee has the responsibility for the transmission, treatment, and disposal of sewage from territory located within its drainage area.

4. At all times pertinent to this complaint, the State of Michigan has been and now is the owner in trust, for the benefit of its citizens, of the waters of Lake Michigan within the State's territorial boundaries, and the protector and guardian of these waters for the use, needs, and enjoyment of its citizens and inhabitants.

Lake Michigan

5. From ancient geological periods, Lake Michigan has been and now is a natural body of fresh water. It is bordered by the States of Illinois, Wisconsin, Indiana, and Michigan. Lake Michigan has been and is now used as a place of recreation, relaxation, and enjoyment by numerous citizens and inhabitants of the State of Michigan. Additionally, Lake Michigan has been and is now a vital source of public water supply for many municipalities, citizens and inhabitants of the State of Michigan.

The Pollution

6. The defendant municipalities and political subdivisions of the State of Wisconsin are located in the State of Wisconsin at and near the shoreline of Lake Michigan. The defendant municipalities and political subdivisions of the State of Wisconsin are now authorizing, causing, permitting, or allowing, and have for a long time heretofore authorized, caused, permitted, or allowed, the discharge of matter and effluents into Lake Michigan, consisting of un-

treated raw sewage or improperly or inadequately treated sewage, which sewage originates from or within the defendants' respective cities or sanitary sewerage systems, all controlled and operated by the defendant municipalities, their employees, servants, or agents. These matters and effluents discharged into the waters of Lake Michigan are contaminants which cause serious and substantial deterioration to the quality of Lake Michigan waters.

7. Said deterioration includes a lessening in the quality of Lake Michigan's waters as a source of drinking water, body-contact recreation, sailing, fishing, and other legitimate uses of Lake Michigan by the PEOPLE OF THE STATE OF MICHIGAN.

8. The above-described damage to Lake Michigan is based on the following factors:

(a) The sewage and contaminants discharged by or with the consent of the defendant municipalities and political subdivisions of the State of Wisconsin contain viruses, pathogens, and various types of bacilli which are harmful to human beings and animals, and which can cause organic malfunction and disease in the human body and in animal bodies; hence, they constitute a severe danger to the health, safety, and welfare of the citizens and inhabitants of the State of Michigan who make use or attempt to make use of the waters of Lake Michigan.

(b) The Lake Michigan territorial waters of Michigan and Wisconsin share a mutual aquatic ecology. Damage to aquatic organisms and to water quality in the Wisconsin territorial waters of Lake Michigan will result in a corresponding damaging impact on aquatic organisms and water quality in the Michigan territorial waters of Lake Michigan.

9. The defendant municipalities and political subdivisions of the State of Wisconsin, and each of them, owe a

duty to riparian land owners and water users and to the PEOPLE OF THE STATE OF MICHIGAN not to pollute Lake Michigan in the manner heretofore described and owe a further duty to preserve the water quality and ecology of Lake Michigan so as not to endanger the health, safety, and welfare of the citizens and inhabitants of the State of Michigan.

10. The defendant municipalities and political subdivisions of the State of Wisconsin have failed and continue to fail to use proper and approved methods and practices to adequately and properly treat and dispose of the sewage emanating from their localities or originating in the sewerage works owned or operated by them; they have thereby neglected to exercise due and proper care and diligence in conducting and carrying out their municipal responsibilities and have thus injuriously affected the rights and legal interests of the citizens and inhabitants of the State of Michigan.

11. Notwithstanding the fact that the defendant municipalities and political subdivisions of the State of Wisconsin have been repeatedly urged to improve their sewerage systems and to halt the discharge of sewage and contaminants into the waters of Lake Michigan, they have until now failed to do so.

12. The activities of defendants, in permitting, allowing or causing the discharge of raw sewage, or inadequately or improperly treated sewage, into the waters of Lake Michigan in such a manner as to cause substantial injuries to the waters of Lake Michigan, as described above, constitute a public nuisance under the common law of the United States and of Michigan.

13. To the best of plaintiff's knowledge and belief, the defendant municipalities and political subdivisions of the State of Wisconsin continue and will continue the wrongful act of discharging sewage and contaminants into Lake Michigan unless restrained and enjoined by order of court.

Plaintiff has no adequate remedy save that afforded by a court of equity. The injuries to Lake Michigan and to the citizens and inhabitants of Michigan are irreparable, and only an order of this court can lead to the elimination, or at least the minimizing, of the injuries to intervening plaintiff.

The Relief

WHEREFORE, plaintiff prays that the Court grant the following relief:

(a) That the Court permanently restrain defendants, and each of them, from discharging raw sewage, or inadequately or improperly treated sewage, into the waters of Lake Michigan;

(b) That the Court order such further relief as equity may require and as the Court may deem proper or appropriate; and

(c) That the Court tax and assess all costs, including expert witness fees, and scientific study and research costs, against defendants.

FRANK J. KELLEY
Attorney General

/s/ HUGH B. ANDERSON
Hugh B. Anderson
Assistant Attorney General

/s/ CHARLES S. ALPERT
Charles S. Alpert
Assistant Attorney General
Attorneys for Intervening Plaintiff

Business Address:

525 West Ottawa Street
Lansing, Michigan 48913
Phone: 517/373-1129

Dated: June 29, 1972

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

No. 72C-1253

PEOPLE OF THE STATE OF ILLINOIS, ex rel. WILLIAM J. SCOTT, Attorney General of the State of Illinois, *Plaintiff*,

PEOPLE OF THE STATE OF MICHIGAN, *Intervening Plaintiff*,

VS.

CITY OF MILWAUKEE, WISCONSIN, et al., *Defendants*.

NOTICE OF HEARING

To: William J. Scott
Attorney General
State of Illinois
188 West Randolph Street
Suite 2315
Chicago, Illinois 60601

City of Milwaukee
Milwaukee, Wisconsin

City of Kenosha
Kenosha, Wisconsin

City of Racine
Racine, Wisconsin

City of South Milwaukee
South Milwaukee,
Wisconsin

Sewerage Commission of
the City of Milwaukee
Milwaukee, Wisconsin

The Metropolitan Sewerage
Commission of the
County of Milwaukee
Milwaukee, Wisconsin

PLEASE TAKE NOTICE that a motion of the State of Michigan for leave to intervene as party plaintiff, of which the annexed is a true copy, will be brought on for hearing before the United States District Court for the Northern

District of Illinois, Eastern Division, at a date, time and place to be set by the Court.

FRANK J. KELLEY
Attorney General

/s/ HUGH B. ANDERSON
Hugh B. Anderson
Assistant Attorney General

/s/ CHARLES ALPERT
Charles S. Alpert
Assistant Attorney General

Attorneys for Intervening Plaintiff

Business Address:

525 West Ottawa Street
Lansing, Michigan 48913
Phone: 517/373-1129

Dated: June 29, 1972

Answer of the Metropolitan Sewage Commission of the County of Milwaukee to Illinois' Complaint

UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF ILLINOIS

Civil Action No. 72-C-1253

PEOPLE OF THE STATE OF ILLINOIS ex rel. WILLIAM J. SCOTT, Attorney General of the State of Illinois, *Plaintiff*,
PEOPLE OF THE STATE OF MICHIGAN, *Intervening Plaintiff*,

v.

CITY OF MILWAUKEE, WISCONSIN, a municipality incorporated under the laws of the State of Wisconsin, and a political subdivision thereof, and

CITY OF KENOSHA, WISCONSIN, a municipality incorporated under the laws of the State of Wisconsin, and a political subdivision thereof, and

CITY OF RACINE, WISCONSIN, a municipality incorporated under the laws of the State of Wisconsin, and a political subdivision thereof, and

CITY OF SOUTH MILWAUKEE, WISCONSIN, a municipality incorporated under the laws of the State of Wisconsin, and a political subdivision thereof, and

THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE, a municipality existing under the laws of the State of Wisconsin, and a political subdivision thereof, and

THE METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE, a municipality incorporated under the laws of the State of Wisconsin, and a political subdivision thereof,
Defendants.

ANSWER OF THE DEFENDANT, METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE TO THE STATE OF ILLINOIS

For its Answer to the Complaint of the State of Illinois, the Metropolitan Sewerage Commission of the County of Milwaukee by Schroeder, Gedlen, Riester & Moerke, its attorneys, admits, denies and alleges the following:

Count I

1. Admits the allegations of paragraph 1 of the Complaint.

2. Admits that the State of Illinois is a sovereign state of the United States and is comprised of more than 11 million citizens; alleges it is without sufficient knowledge or information upon which to form a reasonable belief as to the truth of each and every other allegation of Paragraph 2 of the Complaint and therefore denies them and puts plaintiff to its proof thereof.

3. Admits that the cities of Milwaukee, Kenosha, Racine, and South Milwaukee are cities duly incorporated under the laws of Wisconsin; denies each and every other allegation of Paragraph 3 of the Complaint.

4. Denies each and every allegation of Paragraph 4 of the Complaint.

5. Admits that Lake Michigan is a natural body of fresh water bordered by the states named; alleges it is without sufficient knowledge or information upon which to form a reasonable belief as to the truth of each and every other allegation of Paragraph 5 of the Complaint and therefore denies each of them and puts plaintiff to its proof thereof.

6. Admits that Exhibit B accurately shows the general geographic location of each defendant in relation to the shoreline of Lake Michigan; denies each and every other allegation of Paragraph 6 of the Complaint.

7. Denies each and every allegation of Paragraphs 7, 8, 9, 10, 11, 12 and 13 of the Complaint.

Count II

1. Alleges it is without sufficient knowledge or information upon which to form a reasonable belief as to the truth of the allegations of Paragraph 1 and therefore denies same and puts plaintiff to its proof thereof.

2-8. Realleges and incorporates by reference as if fully set forth herein its responses to the allegations of Paragraphs 2-8 of Count I of the Complaint.

9. Denies each and every allegation of Paragraphs 9 and 10 of the Complaint.

10. Alleges it is without sufficient knowledge or information upon which to form a reasonable belief as to the truth of the allegations of Paragraph 11 of the Complaint and therefore denies same and puts plaintiff to its proof thereof.

11. Denies each and every allegation of Paragraph 12 of the Complaint.

Count III

1. Alleges it is without sufficient knowledge or information upon which to form a reasonable belief as to the truth of the allegations of Paragraph 1 of the Complaint and therefore denies same and puts plaintiff to its proof thereof.

2. Realleges and incorporates by reference as if fully set forth herein its responses to Paragraphs 2-8 of Count I of the Complaint.

9. Denies each and every allegation of Paragraphs 9 and 10 of the Complaint.

AFFIRMATIVE DEFENSES

For affirmative defenses to the allegations of the Complaint, this defendant alleges that:

I

THIS DEFENDANT EXERCISES NO RELEVANT LEGAL POWERS OR DUTIES AND HAS DONE NO ACT RELEVANT TO THE COMPLAINT.

1. This defendant is a Commission consisting of three members charged by S.59.96, Wisconsin Statutes with performing certain duties specified therein on behalf of the Metropolitan Sewerage District of the County of Milwaukee, which district is a municipal body corporate under the laws of Wisconsin of the type and nature generally classified as a "special purpose district".

2. Defendant's relevant powers and actions are limited by the laws of Wisconsin to the financing and the construction of interceptor sanitary sewers in that part of the Metropolitan Sewerage District located outside of the corporate limits of the City of Milwaukee.

3. Upon completion of the construction of such sewers they are turned over to the Sewerage Commission of the City of Milwaukee for operation and maintenance as required by law.

4. Plans and specifications for sewers to be constructed by this defendant are by law required to be approved by the Sewerage Commission of the City of Milwaukee and the Wisconsin Department of Natural Resources prior to the letting of contracts for their construction.

5. Treatment of wastes collected and transmitted in sewers constructed by this defendant is performed by the Sewerage Commission of the City of Milwaukee

as required by the applicable laws of the State of Wisconsin.

6. This defendant does not own or have otherwise subject to its direction and control any operating sewers or sewer systems or otherwise collect or transmit sanitary, industrial or other waste effluents.

II

PLAINTIFF IS ITSELF GUILTY OF CONDUCT SUCH AS IS COMPLAINED OF.

1. Upon information and belief there have existed and do exist substantial sources of wastes within the State of Illinois which contaminate the waters of Lake Michigan in the manner complained of in the Complaint.
2. Upon information and belief from time to time the winds and other geophysical conditions cause waters of Lake Michigan to travel in a Northerly direction conveying said wastes from Illinois waters to Wisconsin waters interfering with the use of Wisconsin waters for recreation and public and other water supply.
3. Upon information and belief plaintiff has failed to properly prevent the substantial contamination of and damage to Lake Michigan by waste discharges subject to plaintiff's regulation and control which are a direct and proximate cause of any damage to plaintiff of the nature complained of.

III

THE CONDUCT OR MALFEASANCE OF PLAINTIFF AND OTHERS IS AN INTERVENING PROXIMATE CAUSE OF ANY DAMAGE TO PLAINTIFF.

1. Upon information and belief, waste discharges emanating and continuing to emanate from sources within

the State of Indiana which the regulatory officials at the State of Indiana have neglected or otherwise failed to properly control or prevent have contaminated and damaged the waters of Lake Michigan and are a direct and proximate cause of any damage to plaintiff of the nature complained of.

2. Upon information and belief waste discharges emanating and continuing to emanate from sources within the State of Michigan which the regulatory officials of the State of Michigan have neglected or otherwise failed to control or prevent have contaminated and damaged the waters of Lake Michigan and are a direct and proximate cause of any damage to plaintiff of the nature complained of.

3. Upon information and belief waste discharges emanating and continuing to emanate from sources within the State of Illinois which the regulatory officials of the State of Illinois have neglected or otherwise failed to properly control or prevent have contaminated or damaged Lake Michigan and are a direct and proximate cause of any damage to plaintiff of the nature complained of.

IV

PLAINTIFF HAS SUBSTANTIALLY VIOLATED ITS RIPARIAN DUTIES AND HAS APPROPRIATED AN UNREASONABLE AND INEQUITABLE SHARE OF THE USE OF LAKE MICHIGAN TO ITSELF.

1. Upon information and belief use of Wisconsin waters of Lake Michigan for recreation, water supply and transportation have been and continue to be substantially impaired and damaged by the illegal diversion of substantial quantities of water from Lake Michigan by the City of Chicago with the knowledge, authorization and consent of plaintiff.

2. Upon information and belief the diversion of water from Lake Michigan by and for the City of Chicago is a direct and proximate cause of any transportation and concentration of wastes originating in other states in Illinois waters in the manner complained of.

3. Upon information and belief the political subdivisions and citizens of the State of Illinois have made unreasonable excessive and illegal appropriations of the waters of Lake Michigan to their own use and benefit and the benefit of plaintiff to the detriment of other riparian users of Lake Michigan by diversion of said waters for purposes other than human consumption, contamination of said waters by discharge of damaging wastes, filling substantial portions of the bed of Lake Michigan inevitably depriving others of the use thereof and otherwise damaging the natural ecology and utility of the waters of Lake Michigan to the great detriment of other riparian users.

V

THIS DEFENDANT HAS COMPLIED WITH ALL KNOWN STANDARDS AND CRITERIA GOVERNING ITS AFFAIRS AND HAS IRREVOCABLY EXPENDED LARGE SUMS IN RELIANCE THEREON; PLAINTIFF IS GUILTY OF LACHES AND IS ESTOPPED THEREBY.

1. This defendant stands in full compliance with all known standards, regulations and orders promulgated by duly empowered regulatory agencies of the United States and the State of Wisconsin.

2. This defendant has completed a substantial portion of its planned construction program to provide sewers to its service area reasonably contemplated to be adequate beyond the year 2000 involving expenditures of vast sums of money and the district has currently budgeted $21,450,000 for new construction expenditures in 1973 in reliance upon all currently known applicable standards and criteria.

3. It is essential to the orderly and efficient conduct of the duties of this defendant pursuant to the laws of Wisconsin that the standards and criteria to be met in the performance of this defendants duties be clear, unequivocal and known prior to the commencement of performance of the construction work.

4. The plans and specifications for all construction work undertaken or planned by this defendant have been filed with and approved by the Wisconsin Department of Natural Resources and its predecessor entities and with the United States Environmental Protection Agency and its predecessor entities and have at all relevant times been matters of public knowledge and record.

5. At no time prior to the commencement of this action did plaintiff make known to this defendant any complaint or dissatisfaction with this defendant's conduct of its statutory affair.

6. It would be unjust, inequitable and substantially wasteful of public funds to impose at this late time new and previously unknown standards and criteria to the work done and being done by this defendant.

VI

USE OF LAKE MICHIGAN FOR DILUTION AND DISPERSION OF MUNICIPAL WASTES IS A REASONABLE RIPARIAN USE OF SUCH LAKE.

1. This defendant has available no reasonable and practical or legal alternative under generally recognized technology except to construct sewers which connect to treatment plants which utilize Lake Michigan for the purpose of ultimately diluting and dispersing treated waste waters.

2. This defendant has no legal direction or control over the treatment facilities to which sewers constructed by it are ultimately connected.

3. The use of the waters of Lake Michigan for dilution and dispersion of wastes originating in sewers constructed by this defendant (which are operated, regulated and maintained by others) is of great and overriding necessity and importance to the protection of the health, safety and general welfare of the public and is reasonable in relation to such alteration of the physical, chemical or biological properties of such waters as may directly and proximately result therefrom, if any, and the uses of such waters by others, including citizens and political subdivisions of plaintiff.

VII

FEDERAL WATER POLLUTION CONTROL ACT AMENDMENTS OF 1972 VEST PRIMARY JURISDICTION IN UNITED STATES ENVIRONMENTAL PROTECTION AGENCY AND ESTABLISHES COMPLETE AND ADEQUATE ADMINISTRATIVE REMEDIES TO PLAINTIFF.

1. The Congress of the United States duly enacted Public Law 92-500 entitled "Federal Water Pollution Control Act Amendments of 1972".

2. Said act became effective on October 18, 1972.

3. Said act sets forth a completely new approach to federal regulation of water pollution premising such regulation upon consideration of the quantity and quality of the effluent discharged by individual sources or categories of similar individual sources and the state of technology of specified points in time, rather than solely upon the desired standard of quality of the receiving waters as in the past.

4. Said act vests in the United States Environmental Protection Agency powers to establish standards and criteria to be imposed upon individual sources of waste discharge and categories of similar individual sources of waste discharge, requires licenses or permits incorporating such standards and criteria as a condition of lawful discharge of waste and establishes administrative and judicial procedures for the enhancement of such standards.

5. Lake Michigan is a federally navigable water.

6. All sources of waste discharge into Lake Michigan are subject to said act.

7. Said act establishes that national policy is to regulate waste discharge in a comprehensive, planned manner coordinating federal and state financial investment with regulatory programs.

8. A United States District Court may adjudicate only those controversies properly brought before it.

9. The United States Environmental Protection Agency has available to it powers, funds and scientific and policy making expertise not available to this court or to the parties to this litigation.

10. The legal remedy sought by plaintiff in this action can be accomplished by the United States Environmental Protection Agency.

11. It is in the best interests of the parties, of the general public and of justice that the control of waste discharges into Lake Michigan be accomplished by the United States Environmental Protection Agency in a comprehensive manner regulating similarly all these similarly situated utilizing the expertise and scientific resources available, rather than for the courts to determine such matters by adjudicating these cases brought before them.

12. Said act would permit plaintiff to seek judicial remedies against any defendant which failed to comply with the requirements of the Environmental Protection Agency or against the Environmental Protection Agency in the event it believes it has been aggrieved by the administrative action or inaction by the Environmental Protection Agency.

ATTORNEY FOR METROPOLITAN SEWERAGE COMMISSION:

/s/ EWALD L. MOERKE, JR.
Ewald L. Moerke, Jr.
Schroeder, Gedlen, Riester & Moerke
108 West Wells Street
Milwaukee, Wisconsin 53203
Tele: 272-4060

Answer of the Metropolitan Sewage Commission of the County of Milwaukee to Michigan's Complaint

UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF ILLINOIS

Civil Action No. 72-C-1253

PEOPLE OF THE STATE OF ILLINOIS, ex rel. WILLIAM J. SCOTT, Attorney General of the State of Illinois, *Plaintiff*,
PEOPLE OF THE STATE OF MICHIGAN, *Intervening Plaintiff*,

v.

CITY OF MILWAUKEE, WISCONSIN, a municipality incorporated under the laws of the State of Wisconsin, and a political subdivision thereof, and

CITY OF KENOSHA, WISCONSIN, a municipality incorporated under the laws of the State of Wisconsin, and a political subdivision thereof, and

CITY OF RACINE, WISCONSIN, a municipality incorporated under the laws of the State of Wisconsin, and a political subdivision thereof, and

CITY OF SOUTH MILWAUKEE, WISCONSIN, a municipality incorporated under the laws of the State of Wisconsin, and a political subdivision thereof, and

THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE, a municipality existing under the laws of the State of Wisconsin, and a political subdivision thereof, and

THE METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE, a municipality incorporated under the laws of the State of Wisconsin, and a political subdivision thereof,
Defendants.

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ANSWER OF METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE, DEFENDANT HEREIN, TO THE COMPLAINT OF THE INTERVENING PLAINTIFF, PEOPLE OF THE STATE OF MICHIGAN

For its Answer to the Complaint of the State of Michigan, the Metropolitan Sewerage Commission of the County of Milwaukee by Schroeder, Gedlen, Riester & Moerke, its attorneys, admits, denies and alleges the following:

Count I

1. Admits the allegations of paragraph 1 of the Complaint.

2. Admits that the State of Michigan is a sovereign state of the United States and is comprised of more than 8 million citizens; alleges it is without sufficient knowledge or information upon which to form a reasonable belief as to the truth of each and every other allegation of Paragraph 2 of the Complaint and therefore denies them and puts plaintiff to its proof thereof.

3. Admits that the cities of Milwaukee, Kenosha, Racine, and South Milwaukee are cities duly incorporated under the laws of Wisconsin; denies each and every other allegation of Paragraph 3 of the Complaint.

4. Denies each and every allegation of Paragraph 4 of the Complaint.

5. Admits that Lake Michigan is a natural body of fresh water bordered by the states named; alleges it is without sufficient knowledge or information upon which to form a reasonable belief as to the truth of each and every other allegation of Paragraph 5 of the Complaint and therefore denies each of them and puts plaintiff to its proof thereof.

6. Admits that Exhibit B accurately shows the general geographic location of each defendant in relation to the

shoreline of Lake Michigan; denies each and every other allegation of Paragraph 6 of the Complaint.

7. Denies each and every allegation of Paragraphs 7, 8, 9, 10, 11, 12 and 13 of the Complaint.

Count II

1. Alleges it is without sufficient knowledge or information upon which to form a reasonable belief as to the truth of the allegations of Paragraph 1 and therefore denies same and puts plaintiff to its proof thereof.

2-8. Realleges and incorporates by reference as if fully set forth herein its responses to the allegations of Paragraphs 2-8 of Count I. of the Complaint.

9. Denies each and every allegation of Paragraphs 9 and 10 of the Complaint.

10. Alleges it is without sufficient knowledge or information upon which to form a reasonable belief as to the truth of the allegations of Paragraph 11 of the Complaint and therefore denies same and puts plaintiff to its proof thereof.

11. Denies each and every allegation of Paragraph 12 of the Complaint.

Count III

1. Alleges it is without sufficient knowledge or information upon which to form a reasonable belief as to the truth of the allegations of Paragraph 1 of the Complaint and therefore denies same and puts plaintiff to its proof thereof.

2. Realleges and incorporates by reference as if fully set forth herein its responses to Paragraphs 2-8 of Count I of the Complaint.

9. Denies each and every allegation of Paragraphs 9 and 10 of the Complaint.

AFFIRMATIVE DEFENSES

For affirmative defenses to the allegations of the Complaint, this defendant alleges that:

I

THIS DEFENDANT EXERCISES NO RELEVANT LEGAL POWERS OR DUTIES AND HAS DONE NO ACT RELEVANT TO THE COMPLAINT.

1. This defendant is a Commission consisting of three members charged by S.59.96, Wisconsin Statutes with performing certain duties specified therein on behalf of the Metropolitan Sewerage District of the County of Milwaukee, which district is a municipal body corporate under the laws of Wisconsin of the type and nature generally classified as a "special purpose district".

2. Defendant's relevant powers and actions are limited by the laws of Wisconsin to the financing and the construction of interceptor sanitary sewers in that part of the Metropolitan Sewerage District located outside of the corporate limits of the City of Milwaukee.

3. Upon completion of the construction of such sewers they are turned over to the Sewerage Commission of the City of Milwaukee for operation and maintenance as required by law.

4. Plans and specifications for sewers to be constructed by this defendant are by law required to be approved by the Sewerage Commission of the City of Milwaukee and the Wisconsin Department of Natural Resources prior to the letting of contracts for their construction.

5. Treatment of wastes collected and transmitted in sewers constructed by this defendant is performed by the Sewerage Commission of the City of Milwaukee

as required by the applicable laws of the State of Wisconsin.

6. This defendant does not own or have otherwise subject to its direction and control any operating sewers or sewer systems or otherwise collect or transmit sanitary, industrial or other waste effluents.

II

PLAINTIFF IS ITSELF GUILTY OF CONDUCT SUCH AS IS COMPLAINED OF.

1. Upon information and belief there have existed and do exist substantial sources of wastes within the State of Michigan which contaminate the waters of Lake Michigan in the manner complained of in the Complaint.
2. Upon information and belief from time to time the winds and other geophysical conditions cause waters of Lake Michigan to travel in a Northerly direction conveying said wastes from Illinois waters to Wisconsin waters interfering with the use of Wisconsin waters for recreation and public and other water supply.
3. Upon information and belief plaintiff has failed to properly prevent the substantial contamination of and damage to Lake Michigan by waste discharges subject to plaintiff's regulation and control which are a direct and proximate cause of any damage to plaintiff of the nature complained of.

III

THE CONDUCT OR MALFEASANCE OF PLAINTIFF AND OTHERS IS AN INTERVENING PROXIMATE CAUSE OF ANY DAMAGE TO PLAINTIFF.

1. Upon information and belief, waste discharges emanating and continuing to emanate from sources within

the State of Indiana which the regulatory officials at the State of Indiana have neglected or otherwise failed to properly control or prevent have contaminated and damaged the waters of Lake Michigan and are a direct and proximate cause of any damage to plaintiff of the nature complained of.

2. Upon information and belief waste discharges emanating and continuing to emanate from sources within the State of Michigan which the regulatory officials of the State of Michigan have neglected or otherwise failed to control or prevent have contaminated and damaged the waters of Lake Michigan and are a direct and proximate cause of any damage to plaintiff of the nature complained of.

3. Upon information and belief waste discharges emanating and continuing to emanate from sources within the State of Illinois which the regulatory officials of the State of Illinois have neglected or otherwise failed to properly control or prevent have contaminated or damaged Lake Michigan and are a direct and proximate cause of any damage to plaintiff of the nature complained of.

IV

THIS DEFENDANT HAS COMPLIED WITH ALL KNOWN STANDARDS AND CRITERIA GOVERNING ITS AFFAIRS AND HAS IRREVOCABLY EXPENDED LARGE SUMS IN RELIANCE THEREON; PLAINTIFF IS GUILTY OF LACHES AND IS ESTOPPED THEREBY.

1. This defendant stands in full compliance with all known standards, regulations and orders promulgated by duly empowered regulatory agencies of the United States and the State of Wisconsin.

2. This defendant has completed a substantial portion of its planned construction program to provide sewers to its service area reasonably contemplated to be ade-

quate beyond the year 2000 involving expenditures of vast sums of money and the district has currently budgeted $21,450,000 for new construction expenditures in 1973 in reliance upon all currently known applicable standards and criteria.

3. It is essential to the orderly and efficient conduct of the duties of this defendant pursuant to the laws of Wisconsin that the standards and criteria to be met in the performance of this defendants duties be clear, unequivocal and known prior to the commencement of performance of the construction work.

4. The plans and specifications for all construction work undertaken or planned by this defendant have been filed with and approved by the Wisconsin Department of Natural Resources and its predecessor entities and with the United States Environmental Protection Agency and its predecessor entities and have at all relevant times been matters of public knowledge and record.

5. At no time prior to the commencement of this action did plaintiff make known to this defendant any complaint or dissatisfaction with this defendant's conduct of its statutory affair.

6. It would be unjust, inequitable and substantially wasteful of public funds to impose at this late time new and previously unknown standards and criteria to the work done and being done by this defendant.

V

USE OF LAKE MICHIGAN FOR DILUTION AND DISPERSION OF MUNICIPAL WASTES IS A REASONABLE RIPARIAN USE OF SUCH LAKE.

1. This defendant has available no reasonable and practical or legal alternative under generally recognized

technology except to construct sewers which connect to treatment plants which utilize Lake Michigan for the purpose of ultimately diluting and dispersing treated waste waters.

2. This defendant has no legal direction or control over the treatment facilities to which sewers constructed by it are ultimately connected.

3. The use of the waters of Lake Michigan for dilution and dispersion of wastes originating in sewers constructed by this defendant (which are operated, regulated and maintained by others) is of great and overriding necessity and importance to the protection of the health, safety and general welfare of the public and is reasonable in relation to such alteration of the physical, chemical or biological properties of such waters as may directly and proximately result therefrom, if any, and the uses of such waters by others, including citizens and political subdivisions of plaintiff.

VI

FEDERAL WATER POLLUTION CONTROL ACT AMENDMENTS OF 1972 VEST PRIMARY JURISDICTION IN UNITED STATES ENVIRONMENTAL PROTECTION AGENCY AND ESTABLISHES COMPLETE AND ADEQUATE ADMINISTRATIVE REMEDIES TO PLAINTIFF.

1. The Congress of the United States duly enacted Public Law 92-500 entitled "Federal Water Pollution Control Act Amendments of 1972".

2. Said act became effective on October 18, 1972.

3. Said act sets forth a completely new approach to federal regulation of water pollution premising such regulation upon consideration of the quantity and quality of the effluent discharged by individual sources or categories of similar individual sources and the state of technology of specified points in time, rather

than solely upon the desired standard of quality of the receiving waters as in the past.

4. Said act vests in the United States Environmental Protection Agency powers to establish standards and criteria to be imposed upon individual sources of waste discharge and categories of similar individual sources of waste discharge, requires licenses or permits incorporating such standards and criteria as a condition of lawful discharge of waste and establishes administrative and judicial procedures for the enhancement of such standards.

5. Lake Michigan is a federally navigable water.

6. All sources of waste discharge into Lake Michigan are subject to said act.

7. Said act establishes that national policy is to regulate waste discharge in a comprehensive, planned manner coordinating federal and state financial investment with regulatory programs.

8. A United States District Court may adjudicate only those controversies properly brought before it.

9. The United States Environmental Protection Agency has available to it powers, funds and scientific and policy making expertise not available to this court or to the parties to this litigation.

10. The legal remedy sought by plaintiff in this action can be accomplished by the United States Environmental Protection Agency.

11. It is in the best interests of the parties, of the general public and of justice that the control of waste discharges into Lake Michigan be accomplished by the United States Environmental Protection Agency in a comprehensive manner regulating similarly all these similarly situated utilizing the expertise and scientific

resources available, rather than for the courts to determine such matters by adjudicating these cases brought before them.

12. Said act would permit plaintiff to seek judicial remedies against any defendant which failed to comply with the requirements of the Environmental Protection Agency or against the Environmental Protection Agency in the event it believes it has been aggrieved by the administrative action or inaction by the Environmental Protection Agency.

ATTORNEY FOR METROPOLITAN SEWERAGE COMMISSION:

/s/ EWALD L. MOERKE, JR.
Ewald L. Moerke, Jr.
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Answer of City of Milwaukee and the Sewerage Commission of the City of Milwaukee to Illinois' Complaint

UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

Case No. 72 C 1253

PEOPLE OF THE STATE OF ILLINOIS ex rel. WILLIAM J. SCOTT, Attorney General of the State of Illinois, *Plaintiff,*

VS.

CITY OF MILWAUKEE, WISCONSIN, et al., *Defendants.*

ANSWER OF DEFENDANTS CITY OF MILWAUKEE AND SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE TO COMPLAINT OF THE STATE OF ILLINOIS

JAMES B. BRENNAN
City Attorney

HARRY G. SLATER
Special Assistant City Attorney

RICHARD F. MARUSZEWSKI
Assistant City Attorney

MAURICE L. MARKEY
Assistant City Attorney

Attorneys for Defendants City of Milwaukee and Sewerage Commission of the City of Milwaukee

UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

Case No. 72 C 1253

PEOPLE OF THE STATE OF ILLINOIS ex rel. WILLIAM J. SCOTT, Attorney General of the State of Illinois, *Plaintiff*,

v.

CITY OF MILWAUKEE, WISCONSIN, a municipality incorporated under the laws of the State of Wisconsin, and a political subdivision thereof, and

CITY OF KENOSHA, WISCONSIN, a municipality incorporated under the laws of the State of Wisconsin, and a political subdivision thereof, and

CITY OF RACINE, WISCONSIN, a municipality incorporated under the laws of the State of Wisconsin, and a political subdivision thereof, and

CITY OF SOUTH MILWAUKEE, WISCONSIN, a municipality incorporated under the laws of the State of Wisconsin, and a political subdivision thereof, and

THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE, a municipality existing under the laws of the State of Wisconsin, and a political subdivision thereof, and

THE METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE, a municipality incorporated under the laws of the State of Wisconsin, and a political subdivision thereof, *Defendants.*

ANSWER

NOW COME the CITY OF MILWAUKEE and the SEWERAGE COMMISSION of the CITY OF MILWAUKEE, by their attorneys, who for Answer to the Complaint of Illinois, admit, deny and allege as follows:

Count I

1. Admit paragraph 1.

2. Admit paragraph 2, except defendants deny that the Attorney General of the State of Illinois is empowered to bring this suit on behalf of the plaintiff.

3. Admit paragraph 3, except defendants deny that the Metropolitan Sewerage Commission of the County of Milwaukee has the responsibility for the transmission, treatment and disposal of sewage.

4. Admit paragraph 4 and with respect thereto allege that the State of Wisconsin has been and now is the owner in trust, for the benefit of its citizens, of the waters of Lake Michigan within the State of Wisconsin's territorial boundaries; that it is the protector and guardian of such waters for the use, needs and enjoyment of its citizens and inhabitants; that the rights of the State of Wisconsin, as hereinbefore alleged, inure to the defendants and the residents of the City of Milwaukee and residents of the State of Wisconsin who are served by and benefit from the services and operations of the defendants; that the rights of all residents of the State of Illinois and the State of Wisconsin in and to the waters of Lake Michigan are subserviant [sic] and subordinate to the rights and prerogatives of the United States of America as trustee of Lake Michigan for all the people of the United States.

5. Admit paragraph 5 and with respect thereto allege, upon information and belief, that the currents and waters of Lake Michigan pass and move more frequently, constantly and more substantially in a direction from south to north along and near the shorelines of Illinois, Indiana and Wisconsin.

6. Answering paragraph 6, allege that the defendants, as provided by the statutes and laws of Wisconsin, maintain and operate an efficient sewage treatment system; that said system is constantly being improved, with the aim

of treating all sewage in accordance with the best practical treatment technology; defendants are taking steps to comply with orders of the Department of Natural Resources of the State of Wisconsin prescribing action to be completed by 1977, with the objective of substantially improving water quality; upon information and belief, that such orders are based upon and in accordance with standards and schedules for improvement of water quality for Lake Michigan approved by the government of the United States of America; upon information and belief, that municipalities and sanitary districts created by and existing under the laws of the State of Illinois have been and are now discharging substances and effluent into Lake Michigan substantially consisting of raw sewage, or improperly or inadequately treated sewage; upon information and belief, that the substances and effluent discharged into the waters of Lake Michigan and which have their source in the State of Illinois are contaminants, chemicals or substances which cause serious and substantial deterioration in the quality of Lake Michigan waters; further answering, defendants deny that any of the claimed discharges allegedly attributable to these defendants travels from the city of Milwaukee or the waters abutting the City of Milwaukee to Illinois or the waters abutting Illinois; upon information and belief, that if any pollution exists in Lake Michigan adjacent to the City of Milwaukee, such pollution is dissipated and rendered innocuous and insignificant within a short distance from Milwaukee; that if any substance or effluent does reach the waters of Lake Michigan within the territorial boundaries of the state of Illinois, it is insignificant and innocuous and does not cause serious or substantial deterioration or damage in the quality of such waters within the territorial waters of Illinois and does not affect the use, needs or enjoyment of such water by the citizens and inhabitants of Illinois; if any pollution, damage or deterioration does exist in Illinois waters, it is attributable, either entirely or in substantial part, to municipalities and

sanitary districts of the state of Illinois discharging matter, substances and effluent into Lake Michigan or to other sources not under the control of and not attributable to these defendants; further answering, defendants allege that in the event plaintiff proves, upon the trial of this action, that any substances and effluent travels in the waters of Lake Michigan and reaches the territorial boundaries of the state of Illinois, then and in that event defendants allege that the substances and effluent deposited in Lake Michigan and attributable to sources within the state of Illinois travels in the waters of Lake Michigan from the territorial boundaries of the state of Illinois northward to and reaches the territorial waters of Wisconsin abutting the city of Milwaukee; that in the event such travel does occur, defendants allege that the deposit of such substances and effluent, having their source in Illinois, causes injury and damage to the defendants and the inhabitants of the city of Milwaukee in the same manner and for the same reasons as alleged in the complaint of the plaintiff.

Further answering, allege that the Milwaukee River has its origin approximately 95 miles north of its confluence with Lake Michigan at Milwaukee; that the said Milwaukee River has a total drainage area of approximately 855 square miles located in Milwaukee, Waukesha, Ozaukee, Washington, Fond du Lac, Dodge and Sheboygan Counties; that the Milwaukee River watershed includes the drainage areas of the Menomonee River and Kinnickinnic River which have their origins outside of the city of Milwaukee and the district served by the Sewerage Commission of the City of Milwaukee; that substances and effluent affecting the quality of such rivers is placed in such rivers at points of origin outside of the city of Milwaukee and outside the area which is served by the Sewerage Commission of the City of Milwaukee; that such substances and effluent are not attributable to these defendants; that these defendants have no control over the same; that the afore-

mentioned rivers, in substantial part, by reason of geographic conditions and the terrain which has existed since ancient geological periods, have a natural flow and drain into Lake Michigan; if any pollution, damage or deterioration of Lake Michigan is caused thereby, such pollution, damage or deterioration, if any exists, is not attributable to or caused by defendants.

Further answering, alleges that Exhibit "B" to the complaint of the plaintiff is incomplete in that it does not reflect all the municipalities or other entities using the waters of Lake Michigan or rivers tributary to Lake Michigan for discharge of matter and effluent or for other uses or purposes which effect the quality of such waters.

7. Deny paragraph 7.

8. Answering paragraph 8, deny that any acts or conduct of the defendants cause any damage to the Lake Michigan territorial waters of the State of Illinois; allege that if any sewage is discharged by the defendants into the waters of Lake Michigan, the effects of such sewage are dissipated, rendered innocuous and become insignificant or minimal within a short distance from the City of Milwaukee; repeat and reallege paragraph 6 of this Answer with the same force and effect as though repeated and set forth verbatim in answer to paragraph 8; allege that defendants have not done any act or failed to do any act which affects the health, safety and welfare of the inhabitants of the State of Illinois with respect to use of the waters of Lake Michigan within the boundaries of Illinois; if there is any damage to any aquatic organisms or water quality in Illinois territorial waters of Lake Michigan, which defendants deny, defendants allege the same is attributable to sources within the State of Illinois or other sources over which these defendants do not have control.

9. Answering paragraph 9, allege that defendants' duty with respect to the use of the waters of Lake Michigan is to

use such waters in a reasonable manner; that defendants are using such waters reasonably.

10. Deny paragraph 10; with respect thereto, allege that defendants have used approved methods and practices to treat and dispose of sewage emanating from their localities and over which sewage the said defendants have control; allege that they have exercised diligence in conducting and carrying out their responsibilities in the treatment of sewage under the statutes, laws and rules applicable.

11. Admit that the sewage system of the defendants can be improved; allege that the problem of sewage treatment of municipalities has been substantially aggravated by concentration of industry and population in and near urban areas, including that of the City of Milwaukee; that the method and technology of treatment of sewage is undergoing constant improvement and change; that defendants are improving their sewage treatment systems and making substantial expenditures therefore; allege that the magnitude of pollution throughout the United States requires financial aid of the federal government; that such financial aid has been assured by the federal government; that laws have been recently enacted providing for such aid; allege that defendants are taking steps to comply with water quality standards applicable to Lake Michigan, and schedules of compliance as prescribed by the State of Wisconsin and as approved by the Environmental Protection Agency of the United States under statutes, rules and guidelines now in effect.

12. Deny paragraph 12.

13. Deny paragraph 13.

14. Further answering, defendants deny each and every allegation not heretofore admitted, denied, qualified or otherwise responded to.

AFFIRMATIVE DEFENSES

Further answering and as and for additional defenses to plaintiff's complaint, defendants allege each affirmative defense, in the alternative, as follows:

A. Defendants allege that the State of Illinois is responsible for contributing to and authorizing pollution of Lake Michigan; that various governmental agencies, industrial corporations and citizens and residents of Illinois have been and are being permitted to foul and are fouling the waters of the lake; that this Court should refuse to grant plaintiff relief until plaintiff is free from committing or permitting pollution of such waters; that plaintiff's action should be dismissed and plaintiff should not be permitted to maintain its action against the defendants until plaintiff is able to prove that it is blameless and that it is not causing or substantially contributing to the pollution which it attributes to these defendants.

B. Defendants allege that under all the circumstances, including the size, volume, the "self-cleansing" powers of Lake Michigan, the long standing existing usage of the parties herein, the minimal extent of the injury, if any, the public necessity of the defendants to treat sewage as presently treated, the capabilities of the defendants in the light of other urgent demands made upon the defendants and its taxpayers who are required to bear the cost for the abatement of the alleged pollution, the absence of control over other sources and causes of pollution, the unfavorable geographical terrain of southeastern Wisconsin and the natural flow of the rivers tributary to Lake Michigan and the pollution of Lake Michigan by sources outside of the City of Milwaukee or beyond the territorial waters of Wisconsin, that the actions and conduct of defendants in treatment of sewage are reasonable; that the abatement, techniques and schedules being pursued in the reduction and elimination of the claimed pollution are reasonable, prudent, and practical in the light of the magnitude of the

problems, both engineering and financial, and of changing technology and of all the circumstances.

C. Defendants allege that the claimed pollution of Lake Michigan, if such pollution exists, is substantially attributable to a rapid and substantial concentration and increase in population and industry in urban areas in and near the cities on Lake Michigan and near rivers tributary to and which drain into Lake Michigan; that such augmented population and industry requires additional sewage treatment facilities; that defendants are taking reasonable steps to improve and augment its facilities; that the defendants will sustain unreasonable economic hardship and will be denied due process of law if they are required to expend large sums of money to construct treatment facilities which may become obsolete in a brief period of time by reason of changing technology or advancements in the sciences relating to pollution abatement, while the quality of the waters of Lake Michigan continue to be degraded by others over which defendants have no responsibility or control.

D. Defendants allege that the City of Milwaukee and the Sewerage Commission of the City of Milwaukee are governmental agencies created by the State of Wisconsin; that the said defendants are required to comply with Chapter 144, Wis. Stats., and comply with orders issued to them by the Department of Natural Resources of the State of Wisconsin; that the Department of Natural Resources has issued orders to said defendants with respect to the abatement of pollution of Lake Michigan; that those portions of Lake Michigan which are within the boundaries of the State of Wisconsin are within the jurisdiction of the State of Wisconsin; that the State of Wisconsin is a trustee of such waters for its citizens and inhabitants and has the power to promulgate all laws, rules and orders pertaining to the quality of the waters of Lake Michigan within its jurisdiction; that the said defendants are required by the

Statutes of the State of Wisconsin to comply with and obey all such orders; that orders have been issued as aforesaid and were and are in full force and effect; that the State of Wisconsin has power to enact laws for the abatement of pollution within the State of Wisconsin; defendants have no control or authority over such matters, except as provided by the Statutes of the State of Wisconsin and or as prescribed in orders of the Department of Natural Resources of the State of Wisconsin; that by reason of the foregoing, plaintiff does not have any cause of action or claim for relief against defendants while such State of Wisconsin orders are in effect; that by reason of such orders the State of Wisconsin is a necessary and indispensable party to this action; that defendants are taking steps to comply with such orders.

E. Defendants allege that with respect to abatement of pollution of Lake Michigan and treatment of sewage, defendants are performing essential governmental functions imposed upon the said defendants which are required by the laws and orders of the State of Wisconsin; that by reason thereof, and the legal restrictions placed upon the defendants by the State of Wisconsin as to their taxing and borrowing power, the State of Wisconsin is the real party in interest; that plaintiff's action although brought in form against these defendants is, in fact and law, an action against the State of Wisconsin; that such action presents a direct issue of law as to the force and effect of the sovereignty and statutes of the State of Wisconsin and the orders of the Department of Natural Resources as hereinbefore alleged, and is, therefore, not within the judicial power of this Court by reason of Article XI, U.S. Constitution.

F. Defendants allege that plaintiff has failed to join the State of Wisconsin which is an indispensable party within the meaning of F.R.C.P. 19; that the power to tax and borrow of the City of Milwaukee is prescribed by and

limited by the Statutes of the State of Wisconsin and that the financial capabilities of the City of Milwaukee to perform governmental functions is limited by such State imposed restrictions; that if the State of Wisconsin is not joined, these defendants by reason of the foregoing and the allegations previously set forth in this Answer, will be denied due process of law to which they are entitled under Article XIV, U.S. Constitution and Section 9, Article I, Wisconsin Constitution; that unless the State of Wisconsin is joined as a party to this action, these defendants may be required to perform obligations imposed upon them by the statutes and orders of the State of Wisconsin and which may be different or inconsistent with any requirements which may be imposed on them by the Court in the event the plaintiff should, upon completion of the trial, be held to be entitled to the relief prayed for in its complaint; that the State of Wisconsin has a direct interest in this controversy; that a final decree, if any should be entered herein, directly affects the sovereignty and interests of the State of Wisconsin and the effectiveness and legality of the orders of the State of Wisconsin heretofore referred to.

G. Defendants allege that the public acts and statutes of the State of Wisconsin and the orders and records of the Department of Natural Resources of the State of Wisconsin are entitled to full faith and credit under the provisions of Section 1, Article IV, U.S. Constitution; that the entry of any order or decree by this Court, different or inconsistent with the public acts and statutes of the State of Wisconsin or the orders of said Department of Natural Resources, denies to the State of Wisconsin and these defendants, as governmental agencies of the State of Wisconsin, the full faith and credit to which they are entitled within the meaning of the aforesaid constitutional requirement.

H. That the defendant City of Milwaukee is a municipality which is created under the laws of the State of Wisconsin and owes its existence to the sovereignty of the State of Wisconsin and is bound by the legislative acts of the state relating to sewage disposal which are of statewide concern; that in the event it is established that any pollution does occur in the waters of Lake Michigan which may be attributable to the City of Milwaukee, which the City does not believe at this time is applicable, or related to any of its acts or actions which it can control, the remedy to be provided is one which the defendants are informed and believe would be extremely costly and involve the expenditure of many millions of dollars which the defendant City of Milwaukee is without capacity to secure; that in such event the assistance and authority of the State of Wisconsin and of the Federal Government with respect to grants or allotments would be essential and a matter of vital consequence in the fulfillment of any remedy which may be decreed; that to such extent unless the State of Wisconsin participates in these proceedings, having the overriding legislative and sovereign authority, the defendant City of Milwaukee would be financially powerless to act with respect to extensive and expansive engineering requirements in order to meet or satisfy remedial directives.

I. Defendants allege upon information and belief, that prior to the commencement of this action plaintiff did not make any demand or complaint to the State of Wisconsin or to the Department of Natural Resources of the State of Wisconsin with respect to the claimed pollution of which it complains; that complaint was not made upon these defendants; further alleges that either the Environmental Protection Agency of the United States or the Department of Natural Resources of the State of Wisconsin, under existing law, can provide adequate remedies at law to the plaintiff if such remedies are required; alleges that upon information and belief that prior to the commencement of

this action plaintiff did not seek such administrative remedies and has not exhausted such remedies.

J. Defendants allege that under the provisions of Secs. 62.25 and 895.43, Wis. Stats., no action founded in tort can be maintained against a political corporation or governmental subdivision or agency thereof unless, within 120 days after happening of the event causing the claimed injury or damage, written notice of the time, place and circumstances of the injury or damage is served upon such political corporation, governmental subdivision or agency; that such notice was not served upon defendants; further allege that Sec. 895.43, Wis. Stats., provides that no suit shall be brought against any political corporation, governmental subdivision or any agency thereof for acts done in the exercise of legislative, quasi-legislative, judicial or quasi-judicial functions; that any acts of the defendants as alleged in plaintiff's complaint, are within the provisions of said statute; that the provisions of the aforementioned statutes and the rights of these defendants thereunder are entitled to full faith and credit under the provisions of Section 1, Article IV, U.S. Constitution.

Count II

1. Answering paragraph 1, deny that the "Environmental Protection Act" (Public Act 76-2429), approved June 29, 1970, Ill. Rev. Stat. 1971, Ch. 111 ½, § 1001, *et seq.*, empowers the relator, William J. Scott, to bring this action to enforce the provisions of the aforementioned Act as therein alleged against the defendants herein; further allege that the aforementioned Act does not have any extraterritorial effect and has no application to the defendants; that the defendants are governmental agencies of the State of Wisconsin and are not subject to the jurisdiction of the State of Illinois or the application of its laws.

2-8. Answering paragraphs 2 through 8 inclusive, reallege paragraphs 2 through 8 inclusive, of the answer of

these defendants to Count I, and incorporate said paragraphs by reference as though fully set forth herein and repeated verbatim as defendants' answer to this Count.

9. Answering paragraph 9, deny that any acts or omissions to act on the part of the defendants are "water pollution" of the waters of the State of Illinois as defined in the Environmental Protection Act hereinabove referred to, if applicable; allege that said Act has no effect or application to the defendants.

10. Deny paragraph 10.

11. Deny paragraph 11; allege that Section 42 of the Illinois Environmental Protection Act has no application to the defendants.

12. Deny any information or belief with respect to paragraph 12 and therefore deny same.

13. Deny paragraph 13.

14. Re-allege all of the affirmative defenses to Count I with the same force and effect as though herein repeated as affirmative defenses to this Count.

15. Further answering defendants deny each and every allegation not heretofore admitted, denied, qualified or otherwise responded to.

Count III

1. Answering paragraph 1, deny that the relator, William J. Scott, has the power under the statutes and the laws of the State of Illinois to commence or maintain this action; allege that if such power did exist under the common law of the State of Illinois, such power was abolished by the statutes of the State of Illinois which pertain to the abatement of water pollution within said state.

2-8. Answering paragraphs 2 through 8 inclusive, reallege paragraphs 2 through 8, inclusive, of the answer of

these defendants to Count II, and incorporate these paragraphs by reference as though fully set forth herein and repeated verbatim as defendants' answer to this Count.

9. Deny paragraph 9.

10. Deny paragraph 10.

11. Re-allege all of the affirmative defenses to Count I with the same force and effect as though herein repeated as affirmative defenses to this Count.

12. Further answering defendants deny each and every allegation not heretofore admitted, denied, qualified or otherwise responded to.

WHEREFORE, defendants pray that the Court grant the following relief:

a) That the Court dismiss the complaint of the plaintiff for the reason that such complaint is insufficient in law and is wanting in equity;

(b) That the complaint of the plaintiff be dismissed for the reason that the plaintiff has an adequate remedy at law and has not exhausted administrative remedies which are available to it and which are adequate, if the Court so determines;

c) That is the event the plaintiff's complaint is dismissed, the Court tax and assess all costs, including expert witness fees and costs of scientific studies and research costs against the plaintiff;

d) In the event the complaint of the plaintiff is not dismissed, the Court make such order as is fair, equitable and just under all of the circumstances and facts existing;

e) In the event the action is not dismissed and a decree or order is made and entered relating to the abatement of pollution of Lake Michigan, such order or

decree be made applicable to all other persons who are contributing to the pollution of Lake Michigan; that all such persons be made subject to the authority of the Court so that any order or decree made and entered be fair and equitable.

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Answer of City of Milwaukee and the Sewerage Commission of the City of Milwaukee to Michigan's Complaint

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

Case No. 72 C 1253

PEOPLE OF THE STATE OF ILLINOIS, ex rel. WILLIAM J. SCOTT, Attorney General of the State of Illinois, *Plaintiff*,
PEOPLE OF THE STATE OF MICHIGAN, *Intervening Plaintiff*,

VS.

CITY OF MILWAUKEE, WISCONSIN, et al., *Defendants*.

ANSWER OF DEFENDANTS CITY OF MILWAUKEE AND SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE TO COMPLAINT OF THE STATE OF MICHIGAN

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UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

Case No. 72 C 1253

PEOPLE OF THE STATE OF ILLINOIS, ex rel. WILLIAM J. SCOTT, Attorney General of the State of Illinois, *Plaintiff*,
PEOPLE OF THE STATE OF MICHIGAN, *Intervening Plaintiff*,

VS.

CITY OF MILWAUKEE, WISCONSIN, a municipality incorporated under the laws of the State of Wisconsin, and a political subdivision thereof, and

CITY OF KENOSHA, WISCONSIN, a municipality incorporated under the laws of the State of Wisconsin, and a political subdivision thereof, and

CITY OF RACINE, WISCONSIN, a municipality incorporated under the laws of the State of Wisconsin, and a political subdivision thereof, and

CITY OF SOUTH MILWAUKEE, WISCONSIN, a municipality incorporated under the laws of the State of Wisconsin, and a political subdivision thereof, and

THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE, a municipality existing under the laws of the State of Wisconsin, and a political subdivision thereof, and

THE METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE, a municipality incorporated under the laws of the State of Wisconsin, and a political subdivision thereof, *Defendants.*

ANSWER

NOW COME the CITY OF MILWAUKEE and the SEWERAGE COMMISSION of the CITY OF MILWAUKEE, by their attorneys,

who for Answer to the Complaint of the Intervening Plaintiff, STATE OF MICHIGAN, admit, deny and allege as follows:

1. Admit paragraph 1.

2. Admit paragraph 2, except defendants deny that the Attorney General of the State of Michigan is empowered to bring this suit on behalf of the intervening plaintiff.

3. Admit paragraph 3, except defendants deny that the Metropolitan Sewerage Commission of the County of Milwaukee has the responsibility for the transmission, treatment and disposal of sewage.

4. Repeat and incorporate by reference paragraph 4 of the answer to the complaint of Illinois with the same force and effect as though re-alleged verbatim herein, except that wherever the State of Illinois or the territorial waters of the State of Illinois are referred to, the same is intended and deemed in this answer to be applicable to the State of Michigan and the territorial waters of the State of Michigan.

5. Admit paragraph 5.

6. Answering paragraph 6, allege that the defendants, as provided by the statutes and laws of Wisconsin, maintain and operate an efficient sewage treatment system; that said system is constantly being improved, with the aim of treating all sewage in accordance with the best practical treatment technology; defendants are taking steps to comply with orders of the Department of Natural Resources of the State of Wisconsin prescribing action to be completed by 1977, with the objective of substantially improving water quality; upon information and belief, that such orders are based upon and in accordance with standards and schedules for improvement of water quality for Lake Michigan approved by the government of the United States of America; upon information and belief, that municipalities and sanitary districts created by and existing under the laws

of the State of Michigan have been and are now discharging substances and effluent into Lake Michigan substantially consisting of raw sewage, or improperly or inadequately treated sewage; upon information and belief, that the substances and effluent discharged into the waters of Lake Michigan and which have their source in the State of Michigan are contaminants, chemicals or substances which cause serious and substantial deterioration in the quality of Lake Michigan waters; if any pollution, damage or deterioration does exist in Michigan territorial waters, it is attributable, either entirely or in substantial part, to municipalities and sanitary districts of the State of Michigan discharging matter, substances and effluent into Lake Michigan or to other sources not under the control of and not attributable to these defendants.

Further answering, allege that the Milwaukee River has its origin approximately 95 miles north of its confluence with Lake Michigan at Milwaukee; that the said Milwaukee River has a total drainage area of approximately 855 square miles located in Milwaukee, Waukesha, Ozaukee, Washington, Fond du Lac, Dodge and Sheboygan Counties; that the Milwaukee River watershed includes the drainage areas of the Menomonee River and Kinnickinnic River which have their origins outside of the City of Milwaukee and the district served by the Sewerage Commission of the City of Milwaukee; that substances and effluent affecting the quality of such rivers is placed in such rivers at points of origin outside of the City of Milwaukee and outside the area which is served by the Sewerage Commission of the City of Milwaukee; that such substances and effluent are not attributable to these defendants; that these defendants have no control over the same; that the aforementioned rivers, in substantial part, by reason of geographic conditions and the terrain which has existed since ancient geological periods, have a natural flow and drain into Lake Michigan; if any pollution, damage or deterioration of Lake

Michigan is caused thereby, such pollution, damage or deterioration, if any exists, is not attributable to or caused by defendants.

7. Deny paragraph 7.

8. Repeat and incorporate by reference paragraph 8 of the Answer to the Complaint of Illinois with the same force and effect as though re-alleged verbatim herein, except that wherever the State of Illinois or the territorial waters of the State of Illinois are referred to, the same is intended and deemed in this answer to be applicable to the State of Michigan and the territorial waters of the State of Michigan.

9. Answering paragraph 9, allege that defendants' duty with respect to the use of the waters of Lake Michigan is to use such waters in a reasonable manner; that defendants are using such waters reasonably.

10. Deny paragraph 10; with respect thereto, allege that defendants have used approved methods and practices to treat and dispose of sewage emanating from their localities and over which sewage the said defendants have control; allege that they exercised diligence in conducting and carrying out their responsibilities in the treatment of sewage under the statutes, laws and rules applicable.

11. Repeat and incorporate by reference paragraph 11 of the answer to the complaint of Illinois with the same force and effect as though re-alleged verbatim herein.

12. Deny paragraph 12.

13. Deny paragraph 13.

14. Further answering, defendants deny each and every allegation not heretofore admitted, denied, qualified or otherwise responded to.

AFFIRMATIVE DEFENSES

Further answering and as and for additional defenses to intervening plaintiff's complaint, defendants allege each affirmative defense, in the alternative, as follows:

Repeat and incorporate by reference all of the affirmative defenses "A" through "J," inclusive, of the answer to the complaint of Illinois with the same force and effect as though re-alleged verbatim herein, except that wherever the State of Illinois or the territorial waters of the State of Illinois are referred to, the same is intended and deemed in this answer to be applicable to the State of Michigan and the territorial waters of the State of Michigan.

WHEREFORE, defendants pray that the Court grant the following relief:

a) That the Court dismiss the complaint of the intervening plaintiff for the reason that such complaint is insufficient in law and is wanting in equity;

b) That the complaint of the intervening plaintiff be dismissed for the reason that the intervening plaintiff has an adequate remedy at law and has not exhausted administrative remedies which are available to it and which are adequate, if the Court so determines;

c) That in the event the intervening plaintiff's complaint is dismissed, the Court tax and assess all costs, including expert witness fees and costs of scientific studies and research costs against the intervening plaintiff;

d) In the event the complaint of the intervening plaintiff is not dismissed, the Court make such order as is fair, equitable and just under all of the circumstances and facts existing;

e) In the event the action is not dismissed and a decree or order is made and entered relating to the abatement of pollution of Lake Michigan, such order or decree be made

applicable to all other States, entities or persons who are contributing to the pollution of Lake Michigan; that all such States, entities or persons be made subject to the authority of the Court so that any order or decree made and entered be fair and equitable.

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Order of the United States Court of Appeals for the Seventh Circuit

UNITED STATES COURT OF APPEALS
FOR THE SEVENTH CIRCUIT
CHICAGO, ILLINOIS 60604

(Argued May 24, 1978)

May 26, 1978.

Before Hon. Thomas E. Fairchild, Chief Judge; Hon. Philip W. Tone, Circuit Judge; Hon. Roy W. Harper, Senior District Judge*

No. 77-2246

PEOPLE OF THE STATE OF ILLINOIS, *Plaintiff-Appellee,*

and

PEOPLE OF THE STATE OF MICHIGAN,
Intervening Plaintiff-Appellee,

vs.

CITY OF MILWAUKEE, THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE, and THE METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE,
Defendants-Appellants.

Appeal of the United States District Court for the Northern District of Illinois, Eastern Division
No. 72-C-1253—John F. Grady, Judge.

ORDER

The panel has determined that an analysis of the appeal, in somewhat further detail than was presented in the briefs of the parties, would aid the panel in its consideration. The panel would like to know the position of the parties with

* Senior District Judge Roy W. Harper of the Eastern and Western Districts of Missouri is sitting by designation.

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respect to the elements required to be proved in order to establish a cause of action for nuisance under federal common law. The panel also seeks assistance in locating the particularized findings of the trial court with respect to such elements and the evidence claimed to support said findings.

Accordingly, the appellees are directed within thirty (30) days from the date of this order to serve and file a memorandum setting forth (1) their position as to the elements required to be proved; (2) the transcript of Judge Grady's oral decision, identifying therein the particularized findings deemed material to such issues, and supplying by footnotes to said transcript record citations of evidence which appellees contend supports such findings; and (3) record citations to evidence which appellees contend supports the reasonableness and necessity of the standards adopted in the final decree.

Appellants may file a responsive memorandum within twenty-one (21) days after the filing of appellees' memorandum.

IT IS SO ORDERED.

Supplemental Memorandum of Plaintiff-Appellee State of Illinois to the United States Court of Appeals for the Seventh Circuit

UNITED STATES COURT OF APPEALS
FOR THE SEVENTH CIRCUIT

No. 77-2246

PEOPLE OF THE STATE OF ILLINOIS, *Plaintiff-Appellee,*
and
PEOPLE OF THE STATE OF MICHIGAN,
Intervening Plaintiff-Appellee,

v.

CITY OF MILWAUKEE, THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE, and THE METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE,
Defendants-Appellants.

Appeal of the United States District Court for the Northern District of Illinois, Eastern Division
Hon. John F. Grady, Presiding

SUPPLEMENTAL MEMORANDUM OF PLAINTIFF-APPELLEE STATE OF ILLINOIS

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INTRODUCTION

This memorandum responds to this Court's order of May 26, 1978[1] and follows the three elements of the Court's order. Part I analyzes and defines a common law public nuisance. Simply put, a public nuisance has been defined as any interference with the right of the community at large. Within this general definition is the principle that actions which endanger or threaten the public health are public nuisances. The case law uniformly speaks in terms of "endanger" the public health or "menace" to the public health as a basis for abatement. The judicial decisions uniformly reject the contention that disease or health injury must actually occur and be proven as a prerequisite to relief.

Basically, the proof in this case goes to the creation of a public health hazard by defendants' discharges of raw and inadequately treated sewage and subsequent transport of the sewage pathogens to Illinois waters. Such health hazards represent a classic common law public nuisance. Moreover, by being a major nutrient contributor to the eutrophication of Lake Michigan, defendants are creating a long-term public nuisance by interfering with the rights of all those who use Lake Michigan to a clear, clean, aesthetically pleasing lake free from objectionable tastes and odors.

Part I also delineates the application of various legal issues to a case of public nuisance. Among these issues are: (a) statutory authorization for actions constituting a pub-

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[1] This order directed appellees to: (1) set forth the elements required to be proved to establish a cause of action for nuisance under federal common law; (2) set forth the transcript of Judge Grady's oral decision identifying the particularized findings deemed material to such issues and to supply transcript record citations of evidence which appellees contend support such evidence; (3) set forth record citations to evidence supporting the reasonableness and necessity of the standards adopted in the final decree.

lic nuisance; (b) balancing public health hazards against economic burdens on the perpetrator; and (c) the burden of proof to be applied.

The courts—including those in Wisconsin—have held that compliance with statutory or regulatory standards is not a defense to a public nuisance charge. They have also refused to balance public health hazards against the convenience of the perpetrator of the nuisance. Finally, the courts have required that proof of a nuisance be by a preponderance of the evidence, rather than some more restrictive standard.

In sum, Illinois, Wisconsin and a host of other states continue to recognize public nuisance as a vital and actively needed legal mechanism to protect the public health and welfare.

In Part II of this memorandum, plaintiffs lay out the contents of Judge Grady's findings of fact and cite record references in support of those findings. The evidence supports the following points:

Public Health Hazard

1. The evidence is unequivocal that defendants discharge enormous quantities of raw and improperly treated sewage into Lake Michigan.

2. These masses of human fecal wastes contain billions of pathogenic (disease-causing) organisms—bacteria and viruses.

3. These organisms can cause numerous serious diseases of the heart (e.g. myocarditis), lungs (e.g. pleurodynia), liver (e.g. hepatitis) and other organs as well as birth defects in children.

4. Shore parallel currents which move in response to wind and temperature regimes in Lake Michigan have sufficient speed and persistence to carry materials discharged

at Milwaukee the distance to Illinois in as little as two and one-half days.

5. The pathogens remain live and infectious for varying periods of time. Shigella and Salmonella (bacteria) will survive four to eight days or more, depending on the temperature of the water. Viruses will survive for periods ranging from two weeks to several months.

6. While the pathogens will be somewhat diluted by a process known as diffusion, a large mass of polluted water will dilute slowly from the edges inward. Thus, much of the dirty water in the center mixes with other dirty water. The result of this slow dilution is that hazardous concentrations of pollutants will still be present in Illinois waters.

7. Even if there was extensive dilution, water treatment plants would reconcentrate the pathogens on their intake filters, creating a health risk under normal operations and a substantial health risk if a breakdown or malfunction occurs.

8. A health risk also exists for swimmers who are exposed to such pathogens.

Eutrophication

9. Milwaukee's sewage is also contributing to the eutrophication of Lake Michigan. Eutrophication is a process whereby a clear, clean, oligotrophic lake becomes cloudy and murky from the growth of suspended plant life.

10. As a lake becomes more eutrophic, objectionable plant life increases and when such plant life dies, it releases objectionable odors. Obnoxious forms of plant life are also responsible for taste and odor problems in public water supplies. This process of eutrophication also has a long-term adverse impact on fish spawning areas.

11. Sewage contributes two key components to this problem. Sewage contains a whole series of nutrients—"a rich

nutrient broth"—for aquatic plant growth. Sewage also contributes phosphorus, the key nutrient to plant growth in Lake Michigan.

12. Milwaukee's treatment plants alone discharge over one million pounds of phosphorus per year—over 50% of the sewage load of phosphorus into Lake Michigan. No one knows how much additional phosphorus is discharged by Defendants' raw sewage overflows.

Part III of this memorandum sets forth the record citations supporting the standards imposed by Judge Grady's order. The defendants have already stipulated to the feasibility of these standards, and the basic purpose of Part III is to provide record support for the need and reasonableness of such standards. Basically the following evidential points support Judge Grady's ordered treatment:

1. Raw sewage should not be discharged into Lake Michigan, but should be collected, stored in retention facilities if necessary, and treated prior to being discharged.

2. Destruction of pathogenic organisms requires effective chlorination by free chlorine.

3. Solid materials encapsulate and shield pathogens from disinfection by the chlorine.

4. Organic materials, commonly measured as Biochemical Oxygen Demand ("BOD"), combine with chlorine to form weak, ineffective disinfectants called combined chlorine, thus allowing vast numbers of pathogens to pass through the treatment plant.

5. In order to expose the pathogens to effective chlorination, the solids must be removed to very low levels prior to chlorination; and in order to maintain a free chlorine—as opposed to a combined chlorine—BOD (organic material) also must be removed to as low a level as possible prior to chlorination. These levels should not exceed 5 milligrams per liter solids or 5 milligrams per liter BOD.

Moreover, a measurement of chlorine effectiveness, known as a free chlorine residual, must be maintained at all times.

6. The 5 milligrams per liter solids and 5 milligrams per liter BOD can be achieved by adding coagulation/sedimentation tanks and filters onto the existing secondary plants.

7. Milwaukee now discharges up to a million pounds of phosphorus annually, which represents 50% of the sewage discharge of phosphorus to Lake Michigan. Milwaukee plants will continue to discharge a phosphorus load of a million pounds even if a concentration of 1 milligram per liter for phosphorus is achieved.

8. An incidental but major benefit of the 5 milligrams per liter solids/5 milligrams per liter BOD standard is a reduction in phosphorus concentrations well below 1 milligram per liter.

I

THE ELEMENTS OF COMMON LAW PUBLIC NUISANCE

A

The Historical Background—Protection Of The Rights Of The Community At Large

In *Illinois* v. *City of Milwaukee,* 406 U.S. 91 (1972), the Supreme Court held that "federal courts will be empowered to appraise the equities of the suits alleging creation of a public nuisance by water pollution." 406 U.S. at 107. While the Supreme Court clearly established the subject matter jurisdiction of the federal district courts to hear such cases under the federal question jurisdiction of 28 U.S.C. § 1331, the Court did not delineate the substantive elements necessary to establish liability under the common law of public nuisance.

The Court gave limited guidance:

> "While federal law governs, consideration of state standards may be relevant [citation omitted]. Thus a

> State with high water-quality standards may well ask that its strict standards be honored and that it not be compelled to lower itself to the more degrading standards of a neighbor. There are no fixed rules that govern; these will be equity suits in which the informed judgment of the chancellor will govern."
>
> 406 U.S. 107-108.

While federal substantive law would apply, the courts should consider local conditions in determining the remedies necessary. Some locations would require more stringent remedies than others.

> "Moreover, geophysical characteristics which define local and regional airsheds are often significant considerations in determining the steps necessary to abate air pollution [citation omitted]. Thus, measures which might be adequate to deal with pollution in a city such as San Francisco, might be grossly inadequate in a city such as Phoenix, where geographical and meteorological conditions trap aerosols and particulates.
>
> "As a matter of law as well as practical necessity corrective remedies for air pollution, therefore, necessarily must be considered in the context of localized situations."
>
> *Washington* v. *General Motors Corp.*, 406 U.S. 109, 115-16 (1972)[2]

Fortunately, the Supreme Court in other cases—usually in dicta—has indicated that it follows the common law of public nuisance established in England and the American

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[2] *Washington* v. *General Motors Corp.* was decided by the Supreme Court on the same day as *Illinois* v. *Milwaukee*, and held that the states could bring federal common law nuisance suits to abate pollution of ambient air. 406 U.S. at 112 n.2.

states.[3] *See generally, Ohio* v. *Wyandotte Chemical Corp.*, 401 U.S. 493, 510 (1971) (dissenting opinion of Justice Douglas);[4] *United Steelworkers of America* v. *United States*, 361 U.S. 39, 60-61 (1959) (concurring opinion of Justices Frankfurter and Harlan); *Mugler* v. *Kansas*, 123 U.S. 623, 672-73 (1887); *City of Georgetown* v. *The Alexandria Canal Company*, 37 U.S. (12 Pet.) 91, 97-98 (1838); *Pennsylvania* v. *Wheeling and Belmont Bridge Co.*, 54 U.S. (13 How.) 519, 563-568 (1851).[5]

Turning to the common law of England, public nuisances can be traced to the 12th Century. At that time, interferences or obstructions to the King's highways were abatable

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[3] Unlike the varying state laws regarding water usage which have confronted the Supreme Court in water rights appropriation cases (e.g., *Kansas* v. *Colorado*, 206 U.S. 46 (1907)), the laws of the various states regarding the substantive elements of common law nuisance are relatively uniform.

[4] "In light of the history of water pollution control efforts in this country it cannot be denied that a vast residual authority rests in the States. And there is no better established remedy in state law than authority to abate a nuisance.[5] "

[5] 2 W. Blackstone; Commentaries *218 (Cooley 4th ed. 1899): "[I]t is a nuisance to stop or divert water that used to run to another's meadow or mill; to corrupt or poison a watercourse, by erecting a dyehouse or a lime-pit for the use of trade, in the upper part of the stream; or in short to do any act therein that in its consequences must necessarily tend to the prejudice of one's neighbour. So closely does the law of England enforce that excellent rule of gospel morality, of 'doing to others as we would they should do unto ourselves.' " (401 U.S. 493, at 510 n.5)

[5] The distinctions made in these decisions between nuisances tried at law and nuisances tried in equity were once very significant and account for much of the historical confusion over differential standards of proof, discussed *infra*.

as public nuisances by criminal indictment and trial by jury.[6]

By the time of Blackstone's lectures some six centuries later, the law remained that public nuisances were a crime.[7] The remedy for such public nuisance was by indictment and trial by jury; and if convicted, the defendant was required to abate the nuisance. IV Blackstone *166. Blackstone defined the crime of public nuisance as follows:

> "Common nuisances are a species of offenses against the public order and economical regimen of the state; being either the doing of a thing to the annoyance of all the king's subjects, or the neglecting to do a thing which the common good requires."[8]

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[6] Glanville, *A Treatise on the Laws and Customs of the King of England* (circa 1189 A.D.), *A Translation of Glanville by Beame* (1900)), p. 194:

> "And, generally speaking, whenever a Nuisance is committed affecting the King's Lands, or the Kings High Way, or a City, the suit concerning it belongs to the Kings' Crown. But Purprestures of this description are enquired after, either in the King's Chief Court, or before his Justices sent into the different parts of the Kingdom for the purpose of making such Inquisitions, by a Jury of the Place, or Vicinage. And if, by such Jury, a man be convicted of having made any Purpresture of this kind, he shall be amerced to the King to the extent of the whole Fee that he holds of him, and shall restore that which he has encroached upon; . . ."

[7] "And nuisances are of two kinds: public or common nuisances, which affect the public and are an annoyance to all the King's subjects; for which reason we must refer them to the class of public wrongs, or crimes and misdemeanors. . . ." III Cooley's *Blackstone Commentaries on the Laws of England* *215 (3d ed. 1884) (hereinafter "Blackstone").

[8] IV Blackstone *166. Among such common or public nuisances were "annoyances in highways, bridges and public rivers by rendering the same inconvenient or dangerous to pass, either positively, by actual obstructions or negatively by want or reparations." *Id.*

Stephens defines public or common nuisance as follows:

> "A common nuisance is an act not warranted by law or an omission to discharge a legal duty, which act or omission obstructs or causes inconvenience or damage to the public in the exercise of rights common to all His Majesty's subjects." [9]

He goes on to classify as a public nuisance acts which endanger the health of the public:

> "Every person commits a common nuisance who does anything which endangers the health, life, or property of the public or any part of it." [10]

Hawkins, in *Pleas of the Crown,* (8th ed. 1824)[11] also describes a hazard to public health as a common nuisance:

> "Also it hath been holden to be a common nuisance to divide a house in a town for poor people to inhabit in, by reason whereof it will be more dangerous in time of infection of the plague."
>
> *Id.*, at 694

The principle that a hazard to the public health constitutes a public nuisance is well established in the common law of the states in America.

In *Attorney General* v. *Jamaica Pond Aquaduct,* 133 Mass. 361 (1882), the state obtained an injunction to prevent the drawing down of the Jamaica Pond, which would expose large areas of slime, mud and offensive vegetation.

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[9] Stephens, *A Digest of the Criminal Law* (7th ed. 1926), p. 178.

[10] *Id.*, at 186. Stephens gives the following illustration of a health hazard constituting a public nuisance:

> "A carries a child infected with the small-pox along a public highway in which persons are passing, and near to inhabited houses. A commits a common nuisance." *Id.*, at 187.

[11] First published in 1721.

A nuisance was found because draining the pond would expose its shores "thus endangering the public health." 133 Mass. at 363.

In *City of Ludlow* v. *Commonwealth*, 56 S.W.2d 958 (Ky. Ct. App. 1933), the court stated:

> "[N]o rule of law is better settled than that whatever *endangers* public health is a public nuisance." 56 S.W. 2d at 959 (emphasis added).

The Pennsylvania Supreme Court held that the common law public nuisance included health hazards in *Commonwealth ex rel. Schumaker* v. *New York and Pa. Co.*, 367 Pa. 40, 79 A.2d 439 (1951), stating:

> "Corruption of water, when it affects the public use of a stream or *menaces* the public health, becomes a public nuisance which the commonwealth may suppress by criminal proceedings upon indictment for maintaining a public nuisance and upon conviction the court may in its sentence include an order requiring abatement of the nuisance. See Barclay v. Commonwealth, 1855, 25 Pa. 503. Also the Commonwealth may proceed in equity for an injunction requiring abatement of the nuisance."
>
> 79 A.2d at 444 (emphasis added)[12]

In *Mitchell Realty Co.* v. *City of West Allis*, 184 Wis. 352, 199 N.W. 390 (1924), a private landowner sued West Allis, a city contiguous to Milwaukee, for damages and to abate a nuisance caused by defendant's sewage inundating her land. The City of Milwaukee was allowed to join in the action as a plaintiff to demand abatement of the sewage discharges, because the stream into which the defendant discharged its sewage flowed past a Milwaukee city park. The

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[12] *Webster's New World Dictionary* (2d ed. 1976) defines the word "menace" as "threatening," and the word "endanger" as "to expose to harm."

Wisconsin Supreme Court noted that the sewage could affect the health of Milwaukee's citizens and defined the conduct as a public nuisance because of such health hazard. "It is public because of the *danger* to the public." 199 N.W. at 397 (emphasis added).

This prophylactic concept of abating a public health hazard or risk before the disease becomes a reality has been carried forward to statutory tools closely related to common law nuisance. For example, Count II of the complaint in the instant case is based on the Illinois Environmental Protection Act, Ill. Rev. Stat. Ch. 111-1/2, § 1001 *et seq.*

Section 1012 states:

> "No person shall:
>
> (a) Cause or *threaten* to allow the discharge of any contaminants into the environment *in any State so as to cause or tend to cause water pollution in Illinois,* either alone or in combination with matter from other sources, or so as to violate regulations or standards adopted by the Pollution Control Board under this Act; . . ." (emphasis added).

Section 1003(n) defines water pollution in classic nuisance terms:

> "(n) 'Water pollution' is such alteration of the physical, thermal, chemical, biological or radioactive properties of any waters of the State, or such discharge of any contaminant into any waters of the State, as will or is likely to create a nuisance or render such waters harmful or detrimental or injurious to public health, safety or welfare, or to domestic, commercial, industrial, agricultural, recreational, or other legitimate uses, or to livestock, wild animals, birds, fish, or other aquatic life."

Perhaps the most significant development in the law of health hazard prevention is found in the Eighth Circuit decision in *Reserve Mining Co.* v. *Environmental Protection Agency,* 514 F.2d 492 (8th Cir. 1975). There the factual controversy involved the discharge of asbestos-like fibers into Lake Superior. The key controversy was wether asbestos fibers in water were carcinogenic. There was no proof of actual harm caused by ingestion of the fibers. Indeed, there was no quantitative evidence that rates of cancer would increase by drinking Lake Superior water. All that the evidence showed was that there was medical concern regarding the health risk of the asbestos. The court said:

> "In assessing probabilities in this case, it cannot be said that the probability of harm is more likely than not. Moreover, the level of probability does not readily convert into a prediction of consequences. On this record it cannot be forecast that the rates of cancer will increase from drinking Lake Superior water or breathing Silver Bay air. The best that can be said is that the existence of this asbestos contaminant in air and water gives rise to a reasonable medical concern for the public health. The public's exposure to asbestos fibers in air and water creates *some health risk. Such a contaminant should be removed.*
>
> "As we demonstrate in the following sections of the opinion, *the existenceof this risk to the public justifies an injunction decree requiring abatement of the health hazard on reasonable terms as a precautionary and preventive measure to protect the public health.*"
>
> 514 F.2d at 520 (emphasis added)

The Eighth Circuit deliberately stayed away from the uncharted waters of federal common law nuisance in articulating a legal rationale for its action in abating a public health hazard. 514 F.2d at 520. Instead, it relied on a federal statute which allowed abatement of a discharge which was "endangering" the public health.

However, the key significance of its holding was a recognition of the need to protect public health before injury occurred. The court selected from a panoply of legal tools available as a basis for abating public health hazards. The concept of public health "endangerment" remains the same whether found in a statute or in the common law of nuisance. If this Court so desires, it can use the very same concept of threatened harm found in the Illinois Environmental Protection Act or the state common law of nuisance in lieu of declaring substantive doctrines of federal common law.

Reserve Mining also has another facet of interest in this case. Much is made by defendants here of the presence of water treatment plants in Illinois to prevent harm. In *Reserve,* filters were placed in Duluth's water intakes to serve as an interim solution. But water plant filtration was not permitted to justify continued permanent discharges by Reserve. The permanent relief ordered was abatement of the discharge.

B

Related Nuisance Issues

1

Statutory Authorization To Discharge Is Not A Defense To Nuisance

The defendants here have repeatedly relied on their claim that the Wisconsin state water pollution control agency has issued permits to defendants allowing their discharge. The question can be raised as to whether the common law action of nuisance survives in an age of administrative permits created under a statutory scheme of regulation. The answer given by the courts of Wisconsin, Illinois, and numerous other states is that nuisance actions remain a viable tool independent of such regulatory schemes.

A leading case is *Costas* v. *City of Fond du Lac,* 24 Wis. 2d 409, 129 N.W.2d 217 (1964). There, the City of Fond du Lac argued that its compliance with the requirements of the state agency constituted a defense to an action for nuisance. The Wisconsin Supreme Court roundly rejected that claim:

> "Relying on Hasslinger v. Hartland (1940), 234 Wis. 201, 290 N.W. 647, the defendant contends the nuisance was caused by the operation of the plant approved by a state agency and, therefore, was not actionable. In Hasslinger it is observed but not held, 'It may be that if the claim of the adjoining landowner is that the manner of operation is such as to constitute a nuisance, the fact that the plant was built according to specifications of the State Board of Health and is being operated in accordance with their orders and regulations may conclusively establish that there is no nuisance arising out of design or operation of the plant.' This misleading language is *overruled* because of the implication that operation of the sewage disposal plant in accordance with specifications and orders and regulations of the state board of health cannot constitute a nuisance."
>
> 129 N.W.2d at 220 (emphasis added)[13]

See also, State v. *Dairyland Power Cooperative,* 52 Wis. 2d 45, 187 N.W.2d 878 (1971), rejecting a claim that an action to abate a discharge must be based on an agency order. There, the Wisconsin Supreme Court allowed the Attorney General of Wisconsin to pursue a public nuisance action independent of the actions of the state pollution control agency.

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[13] *Costas* also held that a court had the power to direct the kinds of remedial measures necessary to abate the nuisance. 129 N.W.2d at 221-222.

Other states' courts have rendered similar decisions upholding the independent utility of public nuisance actions apart from state regulatory schemes. *See, Commonwealth ex rel. Schumaker* v. *New York and Pa. Co.*, 367 Pa. 40, 79 A.2d 439 (1951); *State ex rel. Shevin* v. *Tampa Electric Co.*, 291 So. 2d 45 (Fla. App. 1974); *People ex rel. Scott* v. *United States Steel Corp.*, 40 Ill. App. 3d 607, 352 N.E.2d 225 (1st Dist. 1976).

2

Balancing Public Health Versus Cost To The Perpetrator

Defendants have made much of the presumed cost of the facilities ordered by the district court. Plaintiffs have already pointed out the lack of foundation for such cost estimates. But even such cost claims must be examined in perspective. Without taking credit for the disproportionate industrial contribution,[14] the defendants' expert Heaps estimated that the average cost per household would run less than $6.00 per month for the total project cost, and that estimate assumes no federal aid for any portion of the project. Gordon Culp, a nationally-known expert on advanced wastewater treatment, estimated a cost of $59 million for the advanced waste water facilities at a total cost of $1.80 per household per month.

Even if the cost burden on the defendant were more severe, the law is clear that the courts will not allow a public health hazard to persist on a claim of economic inconvenience. The most telling example of this principle is found in *People* v. *City of Port Huron*, 305 Mich. 153, 9 N.W.2d 41 (1943). There, the state Stream Control Commission had ordered Port Huron to build a sewage treatment plant. The Michigan Supreme Court affirmed the

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[14] Federal law requires industries to pay costs consistent with their proportionate load on sewage treatment facilities.

necessity for such an order on the basis of the public health hazard reasoning discussed above:

> "The record contains sufficient testimony to substantiate the State's contention that the present raw sewage disposal method is a *constant menace to the health* and well-being of the downriver communities, as well as to tourists."
>
> 9 N.W.2d at 43 (emphasis added)

The trial judge refused to grant injunctive relief under the doctrine of balancing the equities or comparative convenience. The Michigan Supreme Court rejected such a doctrine in cases of public health:

> "Even if we should concur with the trial judge in his conclusion that 'a balancing of equities' favors the city, this is not a proper case for the application of that doctrine. The doctrine of 'comparative injury' should be confined to those situations where the plaintiff can be substantially compensated. . . .
>
> "The doctrine of 'comparative injury' should not be invoked to justify the continuance of an act that tends to impair public health. In Board of Com'rs of County of Ohio v. Elm Grove Mining Co., 122 W.Va. 442, 9 S.E.2d 813, 817, the court said: 'Notwithstanding a business be conducted in the regular manner, yet if in the operation thereof it is shown by facts and circumstances to constitute a nuisance affecting public health "no measure of necessity, usefulness or public benefit will protect it from the unflinching condemnation of the law."
>
> 9 N.W.2d at 43

The court distinguished the Supreme Court's decision in *City of Harrisonville* v. *W. S. Dickey Clay Mfg. Co.*, 289 U.S. 334, 339 (1932), on the fact that the injury to the complainant W. S. Dickey Clay Co. was wholly financial and no public health hazard was involved. As to the principle

that public health nuisances will not be balanced against the defendant's convenience, *see Commonwealth ex rel. Schumaker* v. *New York and Pa. Co., supra* 79 A.2d at 444;[15] *Board of Comm'rs of Ohio County* v. *Elm Grove Mining Co.*, 9 S.E.2d 813, 817 (W. Va. 1940).

The need for Milwaukee to meet the costs of abating its nuisance discharge to Lake Michigan is amply illustrated by the lengthy litigation in *Wisconsin* v. *Illinois*, 289 U.S. 395 (1933). There, to preserve the rights of Wisconsin in the navigability of Lake Michigan, the Metropolitan Sanitary District of Greater Chicago and the State of Illinois were required to spend enormous sums to built huge sewage treatment plant in lieu of diversion of large amounts of water. *See* opinions at 278 U.S. 367 (1929) and 281 U.S. 179 (1930); decree at 281 U.S. 697 (1930). The fiscal convenience of Illinois and the Metropolitan Sanitary District were not balanced into the need to remove the obstruction:

> "It already has been decided that the defendants are doing a wrong to the complainants and that they must stop it. They must find out a way at their peril. We have only to consider what is possible if the State of Illinois devotes all its powers to dealing with an exigency to the magnitude of which it seems not yet to have fully awaked. It can base no defences upon difficulties that it has itself created. If its constitution stands in the way of prompt action it must amend it or yield to an authority that is paramount to the State."
>
> 281 U.S. at 197

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[15] "When the commonwealth so proceeds its right to relief is not restricted by any balancing of equities, nor by the rule of 'damnum absque injuria' as in Pennsylvania Coal Co. v. Sanderson, 1886, 113 Pa. 126, 6 A. 453, nor by any question of possible prescriptive rights for no matter how long continued stream polluters can acquire no prescriptive or property rights to pollute as against the Commonwealth." *Id.*, 79 A.2d at 444.

Three years later the Sanitary District and the State of Illinois were back before the Supreme Court. The defendants had been stalling in the construction of the ordered sewage treatment works and Wisconsin petitioned for enforcement. The Court emphasized the defendant's responsibility to complete the works even in the face of economic difficulties:

> "Despite existing economic difficulties, the State has adequate resources, and we find it impossible to conclude that the State cannot devise appropriate and adequate financial measures to enable it to afford suitable protection to its people to the end that its obligation to its sister States, as adjudged by this Court, shall be properly discharged."
>
> 289 U.S. at 410

Clearly economic burdens—even where they do exist, which is doubtful here—cannot be used as an excuse to avoid abatement of a public health nuisance.

3

Burden of Proof

The Supreme Court's decision in *Illinois* v. *City of Milwaukee*, 406 U.S. 91 (1972), gives no guidance on the burden of proof to be imposed in federal common law nuisance cases tried in the district courts. And the confusing history of previous Supreme Court statements regarding burden of proof leaves the matter further in doubt. A balanced view of the decisions indicates that the Supreme Court has set a higher than normal standard for cases which come before the Court as original actions, but has not imposed specialized standards of proof for normal actions tried initially in the district court.

Judge Grady below believed that the burden of proof was measured by the perponderance of evidence test normally applied in *civil cases* and uniformly applied in state com-

mon law nuisance cases.[16] But to give the defendants the benefit of any doubt he based his decision on the clear and convincing evidence standard urged by defendants. Judge Grady explained his reasoning as follows:

> "The defendants contend that the evidence must be clear and convincing. I am adopting that view for purposes of this case. The second question is: What must the clear and convincing evidence show? The defendants take the view that because the evidence must be clear and convincing, it must show an actual injury. Otherwise, it is not clear and convincing. It is my view and my understanding of the law that what the plaintiffs must show by clear and convincing evidence is the existence of a hazard, whether or not that hazard has in fact eventuated in an injury. The hazard itself is the injury justifying injunctive relief in this kind of case."
>
> (TR. 14229)

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[16] E.g., *Barrett* v. *Mt. Greenwood Cemetery Ass'n*, 159 Ill. 385, 42 N.E. 891, 892 (1896); *Hayes* v. *Village of Dwight*, 49 Ill. App. 530, 534 (2d Dist. 1893); *aff'd* 150 Ill. 273, 37 N.E. 218. *See, Ethyl Corporation* v. *Environmental Protection Agency*, 541 F.2d 1, 28 (D.C. Cir. 1976):

> "Such certainty has never characterized the judicial or the administrative process. It may be that the "beyond a reasonable doubt' standard of criminal law demands 95% certainty. *Cf., McGill* v. *United States*, 121 U.S.App.D.C. 179, 185 n.6, 348 F.2d 791, 797 n.6 (1965). But the standard of ordinary civil litigation, a preponderance of the evidence, demands only 51% certainty. A jury may weight conflicting evidence and certify as adjudicative (although not scientific) fact that which it believe is more likely than not. Since *Reserve Mining* was adjudicated in court, this standard applied to the court's fact-finding. Inherently, such a standard is flexible, it allows the fact-finder to assess risks, to measure probabilities, to make subjective judgments. Nonetheless, the ultimate finding will be treated, at law, as fact and will be affirmed if based on substantial evidence, or, if made by a judge, not clearly erroneous." 541 F.2d 28 n.58.

The question of what the burden of proof should be in federal district court for common law nuisances rests on a number of difficult issues. The Supreme Court has spoken of different standards of proof for nuisance over the years with very possibly different reasons for each standard.

For example, in *Mugler* v. *Kansas,* 123 U.S. 623 (1887), Justice Harlan states the principle that equity will not restrain a nuisance "except upon clear and satisfactory evidence that one exists." 123 U.S. at 673. What Justice Harlan was clearly referring to is the historic equity practice of withholding injunctive relief in cases of conflicting evidence. In such a case, the facts would then typically be tried by a jury and if a finding of nuisance was rendered, equity would then act. As discussed *infra,* such a standard no longer has meaning now that law and equity have merged and the trial judge who sits as chancellor also sits as trier of fact to resolve conflicting factual questions.

After *Mugler,* the Supreme Court's next articulated an evidentiary standard in the first *Missouri* v. *Illinois* decision, 180 U.S. 208 (1901), emphasizing the need for "determinate and satisfactory evidence" to sustain injunctive relief. 180 U.S. at 248. Here again, the standard is lifted straight from historical limitations on equity practice rather than a standard of proof for the determination and abatement of a nuisance. As discussed above, at common law a public nuisance was abated by indictment, conviction by a jury, and an order of abatement.[17] Courts of equity sitting without a jury gave relief for public nuisances only under unusual circumstances where the usual remedy of abatement at law by indictment was too slow to prevent emergency hazards.

Where an action and trial at law was too slow to prevent impending harm, courts of equity could intervene to pro-

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[17] III Blackstone *220. Similarly, historic abatement of private nuisance was by action at law rather than equity.

hibit a threatened nuisance. It was to be exercised in those cases where " there was imminent danger of irreparable mischief *before* the tardiness of the law could reach it." *City of Georgetown* v. *The Alexandria Canal Company,* 37 U.S. 91, 98 (1838) (emphasis added). The basic rule was that a court of equity had no jurisdiction over crimes, and public nuisances were normally prosecuted as crimes. *State* v. *Uhrig,* 14 Mo. App. 413, 415 (1883).

The reluctance of equity to intervene was primarily predicated on the fact that the chancellor sat without a jury. Actions in equity of necessity deprived the defendant of a trial by jury on the factual basis of the claimed nuisance. 14 Mo. App. at 415, 416. Thus, equity would intervene only in rare cases and only then where the evidence was "determinate and satisfactory." 2 *Story's Equity Jurisprudence* §§ 1251, 1252 (14th ed. 1918). Where evidence as to the injury to the public was conflicting or doubtful, equity would not intervene but would leave the issue of fact to trial by jury.

> "But the question of nuisance or not must, in cases of doubt, *be tried by a jury,* and the injunction will be granted or not as the fact is decided."
>
> *Id.,* § 1250

> ". . . If the legal right is doubtful the practice appears to be to leave that question to trial at law."
>
> *Id.,* § 1250 n.4

Today the conceptual gulf between the fact-finding functions at law and the need for the chancellor to await a trial on the facts at law have little meaning. Equity and law have been merged in the federal courts. Absent a jury demand, the trial judge performs the fact-finding functions of a jury as well as the role of the chancellor. Consequently, it is the trial judge who now performs the function of resolving conflicting factual issues and the historical standard for such resolution in civil cases has been the pre-

ponderance of the evidence. Therefore this Court should follow the same standard of proof followed by law juries to determine liability in controverted fact situations (i.e. preponderance of the evidence) and then apply equitable remedies.

The Supreme Court's next statement as to evidentiary standards comes in the second *Missouri* v. *Illinois* decision, 200 U.S. 496 (1906):

> "Before this court ought to intervene the case should be of serious magnitude, clearly and fully proved, and the principle to be applied should be one which the court is prepared deliberately to maintain against all considerations on the other side."
>
> 200 U.S. at 521

It is not clear whether Justice Holmes was referring to proof required in original actions in the Supreme Court [18] or actions between states,[19] or indeed whether he was referring to any special burden of proof at all. Indeed, in *Georgia* v. *Tennessee Copper Co.*, 206 U.S. 230 (1907), after his opinion in *Missouri* v. *Illinois*, Justice Holmes stated that the State of Georgia proved its case "by a preponderance of the evidence" and that such preponder-

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[18] "Before *this* court ought to intervene," 200 U.S. at 521 (emphasis added).

[19] Justice Holmes was clearly concerned about "interference by *this* court with the action of a State." 200 U.S. 521. But see *Ohio* v. *Wyandotte Chemical Co.*, 401 U.S. 493, 501 n.5 (1971). In an opinion emphasizing the Court's reluctance to have original actions intrude upon the Supreme Court's appellate docket, Justice Harlan indicated that the Ohio action on *state* common law nuisance aginst private parties would be subject to an "unusually high standard of proof" if the Ohio action were brought originally in the Supreme Court. The Harlan opinion suggests that the higher standard of proof is a docket control mechanism for the Supreme Court rather than any special burden based on the substantive cause of action.

ance of evidence met the requirements of *Missouri* v. *Illinois*. 206 U.S. at 238.

The next case where any specialized evidentiary requirement was discussed is *New York* v. *New Jersey*, 256 U.S. 296 (1921). There, the Court, in paraphrasing Justice Holmes' statement in *Missouri* v. *Illinois*, used the "clear and convicing evidence" phrase:

> "Before this court can be moved to exercise its extraordinary power under the Constitution to control the conduct of one State at the suit of another, the threatened invasion of rights must be of serious magnitude and it must be established by clear and convincing evidence. *Missouri* v. *Illinois*, 200 U.S. 496."
>
> 256 U.S. at 309.

Again, like Holmes' opinion in *Missouri* v. *Illinois*, the Court seemed to emphasize a limit on the exercise of extraordinary jurisdiction of the Supreme Court, rather than a standard of proof to be used in civil cases at the district court level. Such an interpretation is given added support by the Court's later decision in *Ohio* v. *Wyandotte Chemical Corp.*, *supra*, that a state action against a private individual—which could be based on state common law nuisance in the state courts of Ohio—would be subject to this "unusually high standard of proof" as an original action in the Supreme Court.

An additional factor may have influenced the Court in both *Missouri* v. *Illinois* and *New York* v. *New Jersey*. In both those cases the complaining state was discharging sewage of the same or worse quality than the defendant state into the very waters sought to be protected. Missouri allowed sewage discharges into the Mississippi upstream of the St. Louis water intake. Defendants admitted that the water supply of St. Louis represented a health hazard,

but contended that the nuisance was caused by Missouri's own cities:

> "That the water supply of St. Louis is polluted and infected defendants do not deny; but they assert that the infected material bringing about this condition is derived, not from Chicago, but from towns, villages and rural communities much nearer, in point of time, to the St. Louis intake at the Chain of Rocks."
>
> 200 U.S. at 511.

> "The evidence in this case establishes the fact conclusively that the sewage discharged into the Missouri and the Mississippi Rivers by the cities situated within the jurisdiction of complainant is sufficient of itself to contaminate and infect the water supply from the Missouri and Mississippi Rivers, exclusive of all other sources of contamination or pollution entering said stream."
>
> *Id.*, at 512-13.

These facts clearly influenced the Court:

> "Where, as here, the plaintiff has sovereign powers and deliberately permits discharges similar to those of which it complains, it not only offers a standard to which the defendant has the right to appeal, but, as some of those discharges are above the intake of St. Louis, it warrants the defendant in demanding the strictest proof that the plaintiff's own conduct does not produce the result, or at least so conduce to it that courts should not be curious to apportion the blame."
>
> *Id.* 200 U.S. at 522

Similarly, in *New York* v. *New Jersey, supra,* the Court emphasized that the City of New York, within the com-

plainant State of New York, discharged into the same waters

> ". . . more than seven times as great a volume of sewage (entirely untreated) as the daily discharge of the proposed sewer would be for many years to come."
>
> 256 U.S. at 303

In summary, the Supreme Court may legitimately be concerned about conservation of its appellate resources by discouraging original actions with a specialized standard of proof. However, nothing in the Court's past actions suggests a desire to penalize public officials seeking to protect the public health at the trial court level. To extend such burden to a *de novo* civil action in a trial court would have ominous effects on protection against public health hazards. Plaintiff State of Illinois respectfully suggests that the traditional civil standard of preponderence of the evidence be declared by the Court as the burden of proof for this and future public nuisance actions.

II

JUDGE GRADY'S FINDINGS AND RECORD REFERENCES TO SUPPORT SUCH FINDINGS

As stated above, Judge Grady found that defendants' raw and inadequately treated sewage discharges create two separate public nuisances:

1. The creation of a health hazard in Illinois waters by reason of the transport of viral and bacterial pathogens.

> "I find from what I regard as clear and convincing evidence that the discharge of sewage by the defendants into Lake Michigan constitutes a health hazard of serious magnitude to the residents of the State of

Illinois and that, unless enjoined by this court, that danger will continue to exist." (A. 41)[20]

2. The substantial contribution by defendants to the accelerated eutrophication of Lake Michigan with resultant harm to the aesthetic beauty of Lake Michigan and resultant adverse effects on the quality of Lake Michigan as a source of potable water (taste and odor problems).

> "I find from what I believe is clear and convincing evidence that the defendants' sewage discharges into Lake Michigan are presently contributing in a substantial way to the accelerated eutrophication of the in-shore zone of the western shore of Lake Michigan, including waters of Lake Michigan which are within the territorial boundaries of the State of Illinois.
>
> "I find further, on the basis of clear and convincing evidence, that due to the interchange of waters in the in-shore and off-shore zones, the defendants' discharges, if continued at anything like present levels, will substantially contribute to the accelerated eutrophication of Lake Michigan as a whole, including waters within the territorial boundaries of the States of Illinois and Michigan." (A. 55-56)

Both of these nuisances—the public health hazard and the problem of eutrophication—fall within the classic common law definitions of public nuisance: an interference with the rights of the community at large.

Judge Grady announced these findings of ultimate fact after setting forth a logical chain of intermediate findings

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[20] The entire transcript of Judge Grady's oral Findings of Fact and Conclusions of Law are contained at pp. 20-67 of defendants-appellants' appendix. References in this memorandum are to the appendix.

of fact based on the evidence at trial. His findings are organized into two areas: public health and eutrophication. This memorandum will track the organization of these findings as set forth in the transcript. Plaintiffs have neither the time nor the space to list all of the evidence to support such findings of fact but will be as comprehensive as possible.

A

Public Health

"The case breaks down into two principal subject matter areas. The first is the matter of public health, and I will address myself to that now." (A. 27)

Finding By The Court: Defendants' Discharges:

"The defendants in this case discharge disease-causing bacteria and viruses to Lake Michigan in two ways. First is the raw sewage which is discharged to Lake Michigan during wet weather periods through devices known as overflows, by-passes and cross-overs from the sanitary sewer system to the storm sewer system."

(A. 27)

Dr. Joseph Melnick testified:

Q. Directing your attention to the city or the metropolitan area of Milwaukee, Wisconsin, will the raw sewage of the City of Milwaukee, Wisconsin or the metropolitan area of Milwaukee, Wisconsin contain enteroviruses?

A. Yes.

Q. How do you know that?

A. Because every city the size of Milwaukee will have carriers of enteroviruses living in the city who will be excreting viruses into the sewage. (Dr. Melnick, TR. 2206)

As to the quantity of virus in raw sewage, defendants' witness Cliver testified:

> Q. To the extent that we have in [sic] infected person within a city, a single person, isn't it correct that a single gram—can you tell the Court for the record what a gram is in terms of relationship to pounds?
>
> A. It is 154th of a pound.
>
> Q. All right, 154th of a pound of feces, human feces, of an infected individual would contain or could contain literally millions of enteric viruses?
>
> A. Yes. (Cliver, TR 10278)[21]

Viruses contained within a quart of sewage range from 7,000 to several hundred thousand infectious units. Dr. Melnick testified:

> Q. Has a standard number of a number been used in the profession as to the typical concentration of plaque form units per liter of sewage, raw sewage?
>
> A. I believe that people at EPA in Cincinnati have used an average of about 7000 infectious units.
>
> Q. So this is 7000 colonies or 7000 plaque form units per liter?
>
> A. 7000 infectious virus particles. I think that is what you ought to call them.
>
> Q. When you say 7000 infectious virus particles, is that synonymous with 7000 plaque form units?
>
> A. That's right.
>
> THE COURT: Per milliliter?
>
> THE WITNESS: No. This is per liter. This is another way of saying it would be enough to infect 7000 people.

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[21] One gram is actually 1/454 pounds.

By Mr. Karaganis: Q. With respect to a liter, in terms of gallons, of course, how much is a liter approximately?

A. A little over a quart.

Q. With respect to this 7000 number, is that as high as plaque form units per liter go in raw sewage?

A. No, we have had samples that we tested that go into the hundreds of thousands.

Q. With respect to that——

A. 7000 is a modest figure. I use it because EPA uses it. We could have a figure of 10,000, 1,000. It is in the thousands.

Q. When you say several hundred thousand, could that occur in the typical urban population under a variety of conditions?

A. Yes. (Dr. Melnick, TR. 2184-2186)

Plaintiffs' witness Geldreich testified:

Q. What is a bacterial pathogen?

A. It is any organism that can produce disease.

Q. Is there a difference between bacteria and viruses?

A. Yes.

Q. What is a bacteria, or a bacterium, for the singular?

A. A bacterium is a much larger organism than a virus, but still is microscopic in size. We are talking quite often in two to seven microns, submicroscopic sizes on some of them, while others are quite large. But in general that would be the size of them. They are more defined than a virus, in that they have a cell which is very easily distinguished.

Q. When I use the term pathogen, what does that mean?

A. A pathogen, in my mind, is any organism that can produce disease.

Q. How many different kinds of bacterial pathogens are there?

A. The number of bacterial pathogens, the total number, is really not known, but if we were to relate only to those which we find commonly in polluted water, salmonella has 400 serotypes, and shigella has 600 serotypes. So already we are talking over a thousand potential pathogens from just two of the known pathogens that are in water. (Geldreich, TR. 3052-3053)

Viruses and bacteria cause disease in humans.

Q. Would it be fair to say the enteric viruses are viruses found in the gut?

A. Right. (Dr. Melnick, TR. 2149)

Enteric viruses are shed through the feces, and fecal transmission is an essential link in infection.

Q. Would it be fair to say that somewhere in the chain of transmission there has to be feces involved?

A. Yes. That is what we mean by fecal-oral transmission. (Dr. Melnick, TR. 2155)

Viral infection and disease are not the same, and a healthy person who becomes infected will also become a transmitter of viral disease without showing the symptoms.

With many enteroviruses, for each person who becomes ill, there may be as many as 100 who never become ill.

However, the first phase of infection is exactly the same as in a person who is going to become sick. The

only thing that is different is that this person who becomes a carrier continues to excrete virus from the feces for long periods of time, and the amount of virus put out in the feces can be very, very high indeed. Yet, there is no way of knowing that such a child or adult is a carrier unless virus assays are done on such a person. (Dr. Melnick, TR. 2145)

The diseases caused by enteric virus:

Myocarditis

Q. You mentioned myocarditis. Can that be caused by one of the Coxsackie viruses?

A. Yes. Coxsackie B particularly. There are a number of Coxsackie B viruses which have as their target organ the muscle tissue.

Q. Muscle tissue?

A. The muscle tissue of the heart.

Q. With respect to the muscle tissue of the heart, what symptoms are shown? Is the one you said affects infants or young children?

A. Yes.

Q. What does it do?

A. It produces inflammation of the heart, so that the heart is unable to pump blood the way it normally should. You have a deficient pump.

Q. As an organism or as a virus like Coxsackie virus that has an affinity toward the heart tissue, as affixes to the cell tissue in the heart muscle, is that destroying cell tissue?

A. Yes. (Dr. Melnick, TR. 2165-2166)

Pleurodynia

Q. You mentioned pleurodynia. Is pleurodynia a symptom, caused by a Coxsackie virus?

A. Yes. It is the disease of the chest. It is a disease of the covering of the lungs, the lining of the chest that covers the lungs.

THE COURT: Excuse me. Which one is that?

THE WITNESS: Pleurodynia.

BY MR. KARAGANIS:

Q. Go ahead.

A. When the lining becomes infected with the virus, there is a great deal of inflammation and pain in the chest. So the patient has discomfort in breathing, and he may be ill for a period of several weeks to a month before this clears. (Dr. Melnick, TR. 2164-2165)

Birth Defects

Q. Do Coxsackie viruses contribute in any way to any prenatal or birth defects?

A. Yes. This is an area that deserves more study than it has been given. But Dr. Brown at the University of Michigan did a very thorough study, in which he followed thousands of women through pregnancy, and for their infection with Coxsackie viruses, and then correlated this with whether or not they had any malformations in the children who are born to them.

Women who are infected with Coxsackie, again the B viruses, during pregnancy had a much higher rate of malformed children than the women who were not so infected. (Dr. Melnick, TR. 2167)

Pericarditis

Q. With respect to Coxsackie viruses, is there a disease symptom involved with one of the strains of Coxsackie called pericarditis?

A. Yes.

Q. What is that?

A. It is an infection of the lining of the heart.

Q. When we have talked about Coxsackie A and Coxsackie B, we have been talking about enteroviruses, have we not?

A. That's right.

Q. And these are the viruses that 99.9 percent of the time must travel through the fecal route, is that correct?

A. That's right. (Dr. Melnick, TR. 2167)

Hepatitis

Q. With respect to the types of hepatitis, which type of hepatitis is the entero type—

A. Type A.

Q. And what disease symptoms does hepatitis type A cause? What organ does it attack?

A. It attacks the liver. (Dr. Melnick, TR. 2168)

Bacteria produce less severe but still debilitating illnesses.

Q. With respect to salmonella, what kinds of disease can salmonella, the various strains of salmonella, cause?

A. Quite often we are talking about a diarrhea or a food poisoning type condition, which more or less is

related to regurgitating the stomach contents. These things produce also fevers. They can be a problem with the patient for a minimum of a few hours to two days or weeks, depending upon which of the strains you are speaking of.

Q. With respect to shigella, which is spelled s-h-i-g-e-l-l-a—is that right?

A. Yes.

Q. What kind of disease symptoms or illnesses does shigella cause?

A. Similar to those of salmonella. Basically we are looking at organisms that cause an intense diarrhea. (Geldreich, TR. 3053-3054)

Defendants' employees have acknowledged the problem in describing Milwaukee's sewage discharge.

All in all, it is apparent that pollution of the surface waters from human sources is tremendous. Defendants' Draft Facilities Plan (Plaintiffs Exhibit 35, p. 12)

Failure to implement a solution to the problem will cause the continuation of sanitary sewage-related health hazards resulting from the introduction of untreated or inadequately treated sanitary sewage to the surface waters, . . . (*Id.* at 279)

The disease-causing bacteria and viruses discussed above are discharged to Lake Michigan by two methods:

First in the form of raw sewage which is discharged to Lake Michigan during wet weather periods through devices known as overflows, by-passes, and cross-overs from the sanitary sewer system to the storm sewer system. (A. 27)

Defendants' employee Wieland testified:

Q. Would it be fair to characterize a sewage treatment system in two parts, namely (a) the collector system and (b) the treatment works?

A. That could be one characterization, yes. (Wieland, TR 117)

Q. In terms of sanitary sewage coming from a residence, is it correct to say that the sanitary sewage is deposited in a lateral sewer and then, from a lateral sewer, goes to a local collector?

A. Yes.

Q. Is it not also true that the local collection system or local collector sewers in the Milwaukee area then connect up with the interceptor sewers operated by the City Commission?

A. Yes. (Wieland, TR. 118)

Q. As far as the interceptor system that picked the sewage from municipal collectors in the City of Milwaukee or in the Metropolitan Sewerage District, is that system of interceptors referred to as the MIS or Main Interceptor System?

A. Yes. (Wieland, TR. 120)

Q. Mr. Wieland, on Plaintiff's Exhibit 51 you have shown green and yellow circles with numbers on them. Would you state what those green and yellow circles represent?

A. The green and yellow circles represent overflow points.

Q. Are those all of the overflow points within the metropolitan interceptor system?

A. No.

Q. What other overflow points are there?

A. There are other overflow points on the local systems.

Q. I am not talking about the overflow points on the metropolitan interceptor system.

A. To the best of our knowledge, that is all there are.

Q. Approximately how many are there?

A. I think there is about 50. I am not sure.

Q. When you describe an overflow point or when you use the term "overflow point," would you describe to the Court what you mean by an overflow point?

A. There are different types, first of all. Some of those that are indicated on the map are what we call relief pumping stations. These pumping stations are installations of pumps that are activated by electrodes so that when the water level in a sewer system gets to a certain point—and this point is usually determined by the critical areas in the service area—the pumps will automatically start operating and discharge the flow into a storm sewer or directly to a water course.

Q. When you say discharge the flow, you are talking about the sewage flow, are you not?

A. Yes.

Q. How many electric pump stations do you have of the approximately 50 overflow points?

A. I think we have 10.

Q. Then what are the remainder of the overflow points? What kind of overflows are those?

A. The others are what we call gravity overflows. When the sewage reaches a certain level in the intercepting sewer system, it reaches a bypass pipe, an

overflow pipe, and runs off into, again, either a storm sewer or the surface waters. (Wieland, TR. 133-35)

Q. So Jones Island is also an overflow point, is it not, where raw sewage is bypassed?

A. There is an overflow at Jones Island, yes.

Q. Isn't it true that raw sewage is bypassed at Jones Island?

A. Yes.

Q. Mr. Wieland, have you or the Commission——

THE COURT: We are using the present tense here, and so there will be no ambiguity later on as to what this witness did say, is your testimony descriptive of the existing situation today, Mr. Wieland, as well as what existed back in 1960?

THE WITNESS: Yes. (Wieland, TR. 135).

Q. Mr. Wieland, what causes an overflow? Why does raw sewage overflow instead of going into the pipe and traveling through to the sewage treatment plant? Why does it overflow?

A. An overflow can be caused by a blockage in the sewer line. It can be caused by more flow in the pipe than the pipe can handle.

Q. Isn't it a fact that most, if not all, of the overflows contained on Plaintiffs' Exhibit Number 52 and Plaintiffs' Exhibit Number 51 operate because of hydraulic overloads in the pipe?

A. Yes.

Q. What causes hydraulic overloads in a pipe?

A. More liquid coming into the pipe than the pipe can handle.

Q. Can that overload be caused by more sanitary sewage coming into the pipe than the pipe can handle?

A. Yes.

Q. Isn't it correct that in the development of the Metropolitan Interceptor System, pipes of a larger capacity were connected to pipes downstream which had a lesser capacity?

A. Yes.

Q. Mr. Wieland, is it correct that the Sewage Commissions have plans to build additional sewers for additional flows that will be carried to South Shore and Jones Island?

A. Yes.

Q. Those flows will be on the flows already carried there, isn't that correct?

A. Yes. (Wieland, TR. 139-140)

Q. The overflow conditions that occur, the overflowing of raw sewage into the lake and in the streams leading into the lake, that is often referred to as wet weather phenomon, [sic] isn't that right, wet weather occurrences?

A. Yes.

Q. Isn't it a fact that the MIS system becomes so surcharged under rainfall that these overflows can keep flowing and keep discharging raw sewage for up to 30 days after the rainfall stops?

* * *

BY THE WITNESS:

A. I think there have been occasions when a particular overflow may have continued for a period after a rainfall or runoff event and, of course, whether it can go

30 days or not depends upon the ground conditions at the time of the rainfall and the length of the rainfall.

BY MR. KARAGANIS:

Q. You yourself know of surcharges and overflows that have gone on for up to 30 days, isn't that right?

A. No, I said it was possible in my deposition.

Q. So the record is clear, did I ask you these questions and did you give me these answers at your deposition on December 27, 1976?

MR. MOERKE: What page, please?

MR. KARAGANIS: Page 207.

BY MR. KARAGANIS:

Q. "Q. Is it your position or statement then that as the MIS overflows, there is no overflowing and conditions where precipitation has not occurred?

A. No, I won't say that because sometimes the overflow takes place after the—continues to take place after the precipitation has stopped.

"Q. How long?

A. It depends upon the sewer system. It depends upon the intensity of the rainfall.

Q. All right. What range of consistency have you noticed in terms of continuing after the——

A. There is no consistency. On some systems it can go for 30 days.

Q. You could have surcharges and overflows for 30 days?

A. You can. You can.

Did I ask you these questions and did you give me these answers?

A. Yes, sir. (Wieland, TR. 353-355)

In addition to the 50 overflows on the Main Interceptor System (MIS) there are 112 overflow points where the City of Milwaukee collector system in the central portion of Milwaukee connects to the MIS. The location of these 112 "CSO" overflows is shown on Plaintiffs' Exhibit 53A. Moreover the City of Milwaukee maintains 78 additional overflow devices called "cross-overs." Defendant's employee Laszewski testified:

Q. With respect to the crossovers and approximately how many sanitary crossovers do you have?

A. In the separate sewered area approximately 78, including the pumps. (Laszewski, TR. 448)

The stench from these sewage overflows gets so foul that in periods of low flow the defendants actually "flush" the contaminated sewage out into Lake Michigan by means of giant flushing tunnels.

Until the intercepting sewage system and wastewater treatment plant was constructed, the City of Milwaukee was entirely dependant on the operation of this installation to replace the foul smelling, cesspool like characteristics of the Kinnickinnic River between the pumping station and the harbor entrance with clear lake water by flushing all sanitary and industrial sewage out into Lake Michigan. After the completion of the intercepting sewerage system and treatment plant, its operation and necessity has decreased somewhat. However, it is still in use to cleanse the river during periods of low flow wherein objectionable pollutional materials, *including sewage discharged into the river* during storm rainfall periods, *are flushed into Lake*

Michigan to prevent an objectionable and odoriferous build-up in the river. Plaintiff's Exhibit 162 (emphasis added).

Finding By The Court: Discharge Standards:

"The second way in which these pathogens are discharged to the lake is in the form of insufficiently treated sewage effluent discharged from the two sewage treatment plants owned and operated by the defendants.

"The pathogens are in the effluent for several reasons. One reason is that the treatment time is often insufficient, due to overloading of the plants, and there is not sufficient time to settle out the solids in the sewage.

"These solids interfere with chlorination, so that the chlorine does not reach the pathogens. Even when the plant is not overloaded many of the solids still fail to settle out.

"The defendants attempt to conform their effluent to a standard of 30 parts per million of suspended solids and BOD, but they rarely achieve that standard and concede that before they can meet it with any consistency a substantial amount of additional plant renovation and updating will have to be done; but even if a 30/30 standard were met, it is my finding that the standard would still result in the discharge of staggering numbers of pathogens to Lake Michigan." (A. 27-28)

The operating records of Defendants' South Shore and Jones Island Treatment Plants are contained in Plaintiffs' Exhibits 92, 93, 94, 95, 112, 123 and 125 and Defendants' Exhibits 1202, 1203, 1205, 1206 and 1207.

The performance of these plants is extremely poor. Plant performance is normally measured by two basic parame-

ters—Suspended Solids and Biochemical Oxygen Demand ("BOD" is an indication of organic material). An analysis of plant records shows that on many days the plants remove little if any of the incoming sewage. Indeed on some days because of poor operation more sewage solids are discharged to Lake Michigan than come into the plant. As discussed below solids and BOD removal are the key to effective chlorination.

Dr. Flora Mae Wellings of the State of Florida Department of Health and Rehabilitative Services has performed literally thousands of virus tests on raw sewage and treated sewage from secondary treatment plants.

> Q. Would it be fair to say then that both with respect to raw sewage and effluents from secondary treatment and activated sludge plants that your samples run into the thousands?
>
> A. Yes. I know they did. (Dr. Wellings, TR. 12293)

Plaintiffs learned of Dr. Wellings from a memorandum written by Mr. Ernest, Defendants' plant manager at Jones Island. In a memo written prior to trial Mr. Ernest states:

> In discussing the question of viruses with Dr. Wellings, it was evident that she was indeed an authority on sewage and water borne viruses. (Memo from Ernest to Borchardt, April 9, 1975.)

Dr. Wellings further testified:

> Q. With respect to that, based on your experience with the activated sludge plants in St. Petersburg, what levels of removal have you seen with respect to an operating activated sludge plant?

* * *

BY THE WITNESS:

A. The results varied tremendously. It depends on the operation of the plant. It depends on the load coming into the plant. If the plant is overloaded, we had coming out what went in.

BY MR. KARAGANIS:

Q. In other words, zero removal?

A. Zero removal. (Dr. Wellings, TR. 12,377-78)

Q. Doctor, have you made inquiry and investigation as to any other operating parameter of plant performance that is related to either low virus removal or high virus removal?

A. The solids is the key to operation.

Q. Would you explain? Is that because the viruses are associated with solids?

A. That's right. (Dr. Wellings, TR. 12,378)

BY MR. KARAGANIS:

Q. Doctor, have I asked you to examine the operational records of the South Shore and Jones Island Plants?

A. Yes. (Dr. Wellings, TR. 12,387)

Let's take 424 out of the sewage coming in. .777 in the final effluent—in the primary effluent, 199 in the final effluent.

BY MR. KARAGANIS:

Q. Do you anticipate much viral movement [sic] under those conditions?

A. You are still going to have a lot of virus coming through even at 199.

Q. With respect to that, the solids coming through, when you have got that, those solids, will they get effective chlorination?

A. No, no, no.

Our aim in St. Petersburg is to reduce solids to a 5, Jackson, JTD, Jackson Turbidity units, which is less than, I think probably 5 milligrams per liter of solids.

Then that gives you the opportunity to have an effective chlorination. (Dr. Wellings, TR. 12,396)

THE COURT: If you have say 5 milligrams per liter of solids, does that help the chlorine remove or kill the viruses associated with those solids more than would be the case if say you had 30 milligrams per liter?

THE WITNESS: Well, the problem with 30 milligrams per liter is you are going to have a lot of organics tied up with solids that is going to use up your chlorine, and the chlorine can't even get into.

THE COURT: I see. So the fewer solids, the less chlorine is used up in other ways?

THE WITNESS: That is right, and that is the reason if you get it down low enough you will have enough active chlorine that can really get to the solids. (Dr. Wellings, TR. 12,398)

Q. Doctor, whenever we are finding high solids well, is it your opinion that even at 30 milligrams per liter of solids that we have a problem with disinfection?

A. I think you would still have a problem with disinfection.

I really don't know how I would equate Jackson Turbidity Units with milligrams, you know, because you would have to know size, shape, and all that, source, because of the test itself; but I would say 5 milligrams per liter would be well in the ball park.

* * *

THE COURT: What do you mean by that phrase? Do you mean that would be what you would desire?

A. Well, I wouldn't want anymore than that.

THE COURT: You would not want anymore than that.

THE WITNESS: I would prefer much less, but I wouldn't want anymore than 5.

BY MR. KARAGANIS:

Q. So if we could perform at a maximum of 5 but consistently there would be ones and twos, would that be it?

A. Yes. (Dr. Wellings, TR. 12,401-02)

Dr. Wellings' court testimony is given added credibility by Ernest's 1975 memorandum where—before Plaintiffs' even knew of her existence—Wellings gave Ernest the same information.

> Dr. Wellings stressed the problems of virus destruction in the presence of solids and indicated that some recent work done in her laboratories indicates that *virus destruction with chlorine in the presence of solids is virtually impossible* from a practical scale. Plaintiff's Exhibit 117 (emphasis added)

The problem of solids shielding the pathogenic organisms and organic materials binding up the chlorine was addressed by numerous other experts.

Dr. Berg—the top EPA expert on viruses in sewage testified:

Q. Now, if there are organic materials present in the water, will that affect or interfere with the disinfectant capability of chlorine?

A. That is right. There are nitrogenous materials, nitrogenous organic materials that are present in

water that will also react with chlorine or with these chloramines and form other chlorine compounds which are much slower virucides or bacteriocides or perhaps are not bacteriocidal or virucidal at all.

Q. So, depending, if they mix up with organics in water, they can be either a slower acting virucide or bacteriocide, or they can be ineffective at all?

A. That is correct.

Q. Now, by the way, when you mix up chlorine with these compounds or particularly with ammonia, what is that called?

MR. KARAGANIS: Strike that.

BY MR. KARAGANIS:

Q. If you are measuring the chlorine in the water after it is mixed up with either ammonia or some of these other materials, what is that called?

A. The chloramines, do you mean?

Q. Yes. What does that measure when you are talking about measuring the chlorine residual?

A. Combined chlorine. We generally refer to this as combined chlorine.

Q. When we measure the amount of chlorine that is left in the water, that is known as the combined chlorine residual under those circumstances?

A. Yes. (Dr. Berg, TR. 12,065-66)

Q. Now, Doctor, with respect to chlorine and its virucidal capability, let's assume it is even a free chlorine, will viruses that are encased in solids be destroyed by free chlorine?

A. Not if the chlorine can't reach them.

Q. So, if we have got fecal material or any other materials surrounding the viruses and you put chlorine on it, will that kill it?

A. The chlorine isn't going to penetrate very far. It is not going to kill embedded virus.

Q. Would it be fair to say that an order to have effective chlorination of the material that you are chlorinating, you should remove the solids?

A. That is correct.

Q. With respect to the organics, do you also try and remove the organics?

A. Yes. You would want to do that in order to prevent or reduce the formation of the compounds that are less effective. (Berg, TR. 12066-67)

Edwin Geldreich, a top EPA expert on bacteria in sewage testified:

Q. What if anything interfers [sic] with effective chlorination?

A. Nutrients, which have a demand for chlorine as one of the major problems. Turbidity, which allows the organisms to be bound so that they may pass right through the exposure of chlorine and still survive in a micropellet or in some clump or particle.

Q. By bound, you mean encased within the solid material?

A. Encased, yes.

Q. When you said nutrient material, is another term for nutrient BOD?

A. Yes. We are talking about nutrients. In this case mostly in terms of organics which combine very readily

with the chlorine to form a variety of compounds, many of which have no input into the disinfection action of the chlorine.

Q. You say many of which have no input. Does that mean they are not good disinfectants?

A. That is correct. (Geldreich, TR. 3083-3084)

A key reason for the poor performance of defendants' plants is the inherent variability in the ability of sewage particles to settle. Defendants' plants rely on gravity settling basins to collect the sewage particles prior to discharge. But variations in the sewage particles and hydraulic flow inhibit settling. Instead of settling, much of the solid sewage goes out into Lake Michigan.

Gordon Culp, a nationally known sewage engineer who is a top consultant to EPA, reviewed Milwaukee's operation and testified:

A. I think as evidenced by operating records from the plant of Milwaukee and many other plants that we have looked at, you get variations in the settling characteristics of the biologic floc that make up the activated sludge, and your last chance to retain those before they escape into the receiving body of water is a gravity separation device, which is the clarifier. If, in fact, they don't settle within that basin, a secondary plant, they are lost to the stream.

Q. Or the lake?

A. Or to the lake, yes. (Culp, TR. 13010)

After describing what defendants discharge from their overflows and treatment plants Judge Grady turned to the transport of the pollutants from Milwaukee to Illinois waters.

Finding By The Court: Transport:

> "These pathogens, once they are discharged to the lake, are on occasion transported by the currents to the waters of the State of Illinois. We know this for several reasons. First of all, both sides concede that on a number of occasions throughout the year, there are currents of sufficient persistence in a southerly direction and of a sufficient speed to transport from the Milwaukee area pathogens which will still be alive when they reach the Illinois state line." (A. 28)

Plaintiffs' witness Captain James Verber of the United States Public Health Service testified as to transport based on his own studies in Lake Michigan performed for the special master in the lake diversion litigation (Lake Currents Plaintiffs' Exhibit 142) and a currents study performed by the University of Wisconsin at Milwaukee by Sato and Mortimer entitled *Lake Currents and Temperatures Near the Western Shore of Lake Michigan* (Plaintiffs' Exhibit 38).

> Q. With respect to the distance from the harbor of the City of Milwaukee to the Illinois state line, are you familiar with the approximate distance, recognizing that the Milwaukee Metropolitan area has variable distances, but speaking of the center of the harbor?
>
> A. Approximately 37 miles to the Illinois line.
>
> Q. Given that distance, have you examined the Sato and Mortimer work and reviewed your own work to determine whether or not there were times in which the movements from the Milwaukee Metropolitan area would have sufficient speed and sufficient duration to reach the Illinois line?
>
> A. Yes. I reviewed some of my early work, which involved 6 hour averages, and I found six specific instances during the period I reviewed, particularly from

station 17, of the data I had on hand, in which persistency occurred from 180 hours at low speed—this in the vicinity of 10 centimeters per second—which was sufficient to carry the water transport in a parcel of water 50 miles in a southerly direction.

Other instances of the other five that I reviewed began at 118 hours and as low as 60 hours, all of which were in excess of 40 miles in these time periods.

Q. When you say in excess of 40 miles, you mean in excess of 40 miles in the total hours?

A. That's correct.

Q. When you say 60 hours, is that two and a half days?

A. That is two and a half days. During a storm period we found one instance of a day and three-quarters, where it would have been approximately 40 miles travelled.

Q. Within a day and three-quarters? (Verber, TR. 2379-80)

Q. Do you have an opinion as to whether waters from the vicinity of the metropolitan area of the City of Milwaukee move into Illinois waters?

A. Yes, as I indicated in my deposition, I estimated that approximately 12 times a year waters would flow from the Milwaukee area as far south as Illinois.

The Mortimer-Sato work indicates that there are years in which this could be greatly exceeded.

Q. The 12 times could be greatly exceeded?

A. The 12 times, yes.

Q. Is the 12 times an average or typical figure?

A. I would consider it more like a typical figure.

Q. Under different years and under different conditions, it could be higher or lower, is that right?

A. That is correct. (Verber, TR. 2392)

Dr. Gabriel Csanady, of Woods Hole Oceanographic Institute, who has studied coastal currents on all the Great Lakes, summarized the phenomenon of coastal transport of pollutants in Lake Michigan as follows:

> [W]ithin the coastal zone, of about 10 km width, currents are generally shore-parallel and persist in one direction or the other for a period on the order of weather cycles, typically 100 hours. On the rise of a stronger wind opposing an established current, the latter reverses direction within a few hours. As a result, parcels of water travel up and down along a coast, their total excursion one way being on the order of the typical current velocity, 30 cm/sec, times the typical weather cycle period of 100 hrs, i.e. up to 100 km. Because water parcels also carry whatever pollutant is injected into them by a nearshore source, what we might call the influence zone of such a source extends a distance of the order of 100 km along the shore in either direction. (Plaintiffs' Exhibit 20, pp. 115-16)

Using actual field data on Lake Michigan current speeds and persistence (TR. 1971-72) Dr. Csanady testified:

> Q. Within this coastal zone or near-shore zone and in the area that is independent of the friction effect of the shore—you have indicated it is approximately three miles out—apart from the coastal jet phenomena, has your research and study given any indication of the speed ranges of these currents?
>
> A. Yes, the typical velocities of wind-driven currents, driven by very strong winds, is in the neighborhood of one foot per second, 30 centimeters per second.

Q. Would you translate the 30 centimeters a second into miles per day?

A. That is approximately 16 miles per day. That is a typical wind-driven current under conditions other than summer.

THE COURT: Conditions other than summer?

THE WITNESS: Other than summer conditions.

BY MR. KARAGANIS:

Q. In the summertime are there other conditions which can occur which can effect the speed of those currents?

A. Yes, in the summertime the top layers of the lake warm and the thermocline forms at approximately 10, 15, 20 meters depth. That thermocline acts as a set of roller bearings, if you like. There is a little friction in that, and the waters can slide essentially without resistance on that surface. Therefore, the currents become stronger in the summer and the coastal zone currents, which we call coastal jets under those conditions, are rather stronger.

Typical velocity is perhaps 50 per cent higher than I mentioned before, to say 25 miles a day for a good strong coastal jet.

But this is not the peak velocity. We have seen a peak velocity as fast as approximately 35 miles a day. (Dr. Csanady, TR. 1950-52)

Q. With respect to this slug, again to clear the record, would it be fair to say that when you talk about slug, you refer to a discrete mass or discrete body of polluted water?

A. Yes, that polluted water that enters Lake Michigan following the heavy rainstorm. It is a large body of water that forms a cloud or patch or slug in the lake water. (Dr. Csanady, TR. 1996)

> Q. To summarize your evaluation of whether the pollutants from the Milwaukee harbor area reach Illinois waters, do you have an opinion as to whether waters from the Milwaukee harbor containing sewage wastes reach Illinois waters?
>
> A. Yes, Mr. Karaganis. In summary of my testimony, I believe that under a combination of adverse circumstances, notably heavy rainstorm, which generates the large slug of effluent at Milwaukee, and a subsequent rapid transit of the pollutants via the currents, a relatively fast and persistent current, under those circumstances the slug originating from Milwaukee and arriving in Illinois waters would contain enough fecal coliforms or perhaps other objectionable constituents to constitute an objectionable level of concentration. (Dr. Csanady, TR. 2063)

Defendant's experts also agreed that their own data showed currents of strong enough persistence to move pollutants discharged from Milwaukee to reach Illinois waters.

Dr. Pritchard testified for the defendants and acknowledged on cross-examination:

> Q. There is no question that everything you have seen indicates that a substance which is placed at Milwaukee will reach Illinois waters, isn't that right?
>
> A. Correct, at some frequency. (Pritchard, TR 7175)

Harry Carter also testified on direct examination for defendants as follows:

> Q. So that means that with respect to the 13 months during which you had data from Zion, there were four times when effluents released at Milwaukee have reached the Illinois state line, assuming that the currents between Milwaukee and the state line were as they were at Zion during the testing period?
>
> A. That is correct. (Carter, TR. 8671)

Defendants' experts measured current speeds which showed speeds and persistence sufficient to move the effluent from Milwaukee to Illinois in as little as 52 hours (a little over two days) or as long as 122.5 hours (a little over five days). (Defendants' Exhibit 905, letter from Carter to McCabe)

Finding By The Court: Pathogen Survival:

> "The bacteria live on the order of four to eight days in the water, and there is a phenomenon known as regrowth, which can result in a substantial replacement of bacteria which die by the birth of new bacteria occurring during the southward flow. Viruses, which I regard as the more serious of the two principal types of pathogens with which we are concerned, live for a week and a half or two weeks in warm water and can live for months in cold water." (A. 28)

Edwin Geldreich testified as to bacterial survival:

> Q. With respect to a mass of untreated or improperly treated sewage, is persistence a phenomenon that is likely to occur?
>
> A. Yes.
>
> Q. So we have persistence straight, that is a period at which the original concentrations remain at or near the discharge level and only after the period of persistence do they then begin to demonstrate the 90 percent die—off curve, is that right?
>
> A. That's correct.
>
> THE COURT: How long does it take them to die off? Do they all go at once?
>
> THE WITNESS: It will take about 2 to 4 days.
>
> THE COURT: More?
>
> THE WITNESS: Yes, sir.

THE COURT: So in other words, instead of having 2 to 4 days, you have 4 to 6 days.

THE WITNESS: Yes, sir.

BY MR. KARAGANIS:

Q. With respect to the question of nutrients being in sewage or in sewage discharge——

THE COURT: I really didn't state that right. It would be 4 to 8 days, rather than 4 to 6 days.

MR. KARAGANIS: It could be as high as 4 to 8.

THE WITNESS: Yes, sir. (Geldreich, TR. 3094-95)

As to virus survival Dr. Melnick testified:

Q. How long a time are we talking about for enteric viruses to die off?

A. It depends upon the time of the year. It depends upon temperature. As there is temperature fluctuation, this varies a good deal.

Q. Let's take the summer time with water temperatures at 70 degrees.

A. I would say then it would probably take about two weeks for it to die off.

Q. Is that a range or is there longer times?

A. It ranges. A virus may persist for months actually, and as you get into the cooler weather, it will persist for an indefinite period of time. (Dr. Melnick, TR. 2199)

Finding By The Court: Pathogens In Illinois Waters:

"There is no doubt that viruses and bacteria have a long enough life span to reach Illinois in the persistent currents which occur a number of times a year. How

many times a year this occurs is, of course, impossible to state with any certainty. The plaintiffs' experts estimate something like a dozen times a year. The defendants' experts estimate that it is more like four times a year or possibly even two times a year. But both sides concede that their estimates could be off either on the high side or the low side." (A. 29)

Dr. Csanady testified for Plaintiff:

Q. Dr. Csanady, with respect to the meteorological conditions under which these movements can occur, is it possible to predict with specific accuracy how many times a year or how many times a month or how many times a week these meteorological and current phenomena would occur that will take this material into Illinois waters?

A. Certainly not with any specific assurance for any given year. One can give some guidelines in this regard that the frequency of cyclonic storms is such and such. They occur with a certain regularity, and there are summers when one would encounter a number of such heavy rainstorms in quick succession. Once a weather patterns gets established, as we all know this winter, it tends to remain in that same pattern.

So if one has a wet summer, for example, one would have a number of successive rainstorms at perhaps weekly intervals.

One cannot say that it would happen in any given year with any given frequency, but perhaps one can estimate the frequency of this in the neighborhood of perhaps once a month on a longer term basis.

Q. When you say once a month, is that a frequency on a long term basis of 12 times a year?

A. Yes, as a very crude estimate. I don't want to put very great reliance on this number. It is weather de-

pendent and depends on some other factors as well. So there is a lot of randomness in this.

Q. In a given year, could it be more than 12 times a year?

A. I assume it could be more. I assume it could be less. (Dr. Csanady, TR. 2058-59)

Dr. Pritchard testified for defendants:

Q. Now, in terms of the current persistence, and you mentioned that in 1973 you had found current persistence, or, in other words, the length of time that the current persists times the current speed, to be, I think you said, four excursions of sufficient length.

A. That is correct.

Q. That does not mean, again, as we discussed in terms of the other current meter values, that any one year is always going to be four times, does it?

A. No. Sometimes it would be zero, and sometimes it would be more. And some statistician could comment on that. I am not professing to state how representative that is.

Q. So with respect to current persistence and current speed, we have some information which gives us a window in time which tells us that this is what happened that year from which we may generalize but we can't come up with that this is always going to be the number, isn't that right?

A. Correct. (Pritchard, TR. 7168)

It must be emphasized that these estimates only relate to direct non-stop transport of pollutants from Milwaukee to Illinois waters. Any viruses which settle to the bottom can live for months and can be resuspended and trans-

ported by new currents as a new source of infection weeks or months after the initial discharge.

Q. So that we can have material lying on the bottom in a form, say, of fecal matter, which during a storm can be resuspended and carried by whatever currents happen to be going by, isn't that right?

A. If there is fecal matter there. I don't say that there is. I don't know.

Q. But if there is——

A. If there is, it can be resuspended.

Q. And having been resuspended, it will go wherever the currents will take it, is that correct?

A. That's correct. (Carter, TR. 8862-63)

Defendants' witness Cliver acknowledged:

Q. Let's take a situation such as a wintertime situation. Let's assume further—and by "wintertime," let's take 35 degrees Fahrenheit or 38 degrees Fahrenheit as the water temperature.

Let's assume that we are on a regular basis putting out solids materials which have viruses in them, and the solids materials—some of it settles in the harbor bottom, some of it gets out into the lake and is moved, and maybe it settles somewhere else, and as the winter progresses, progressively more cumulative materials are deposited.

You are saying that under some circumstances these materials will settle to the bottom, is that right?

A. Under some circumstances.

Q. And those are typically quiescent conditions, are they not?

A. Yes.

Q. And with respect to quiescent conditions, after they have settled to the bottom, if turbulent conditions come up, they can be resuspended, can they not?

A. Yes.

Q. So if we have a body of virus or viral solids-associated material that has survived over time, it can be resuspended, and while it is not now coming from its original source, it is still a viable source in infection within the lake, is it not?

A. If it doesn't also get inactivated somewhere along the line. But, yes, under the conditions you are describing. (Cliver, TR. 10,323-24)

Finding By The Court: Dilution:

"In addition to the die-off of the pathogens themselves, there is another factor which ameliorates the problem to some extent, and that is the phenomenon of dilution. The water which comes down in a parcel doesn't come down intact in the exact form that it left Milwaukee Harbor. Rather, it dilutes with the other water in the lake.

"The experts are in conflict as to the amount of dilution and even as to the proper scientific principle to be applied to determine the amount of dilution. Notwithstanding that dispute—which I resolve in favor of the plaintiffs on the basis of what I perceive to be the greater credibility of their witness on the subject—there still is not sufficient dilution to eliminate the viruses and the bacteria from the water which we know arrives in Illinois from Milwaukee on some occasions during the course of the year." (A. 29-30)

As discussed below, much of the dilution argument is superfluous because water intake plants will reconcentrate

the pathogens. But even using the defendants' own dilution formula, dilution is still insufficient to eliminate a hazard.

Dilution is calculated by a series of complicated mathematical formulas based on observed data on how fast patches of water spread or expand over time. The speed with (or time in) which the patch spreads is called diffusion velocity. Defendants used a mathematical formula called the Okubo-Pritchard Model. Defendants' witness Carter was asked to use his own Okubo-Pritchard formula and to plug in actual data. Using actual data on fecal coliform counts taken at Milwaukee Harbor entrance by the defendants (see Plaintiffs' Exhibits 146-149) and using diffusion velocities actually measured by defendants, Carter testified that dilution could be as little as 5.286 to 1 over the distance between Milwaukee and the Illinois line. (TR. 8920) Moreover using die-off curves developed on bacteria in Lake Michigan tests Carter predicted fecal coliform values in Illinois waters of 2,179 per hundred milliliters:

> Q. Yes, the .58 to start with, and let's start again with the assumptions being here that we are dealing with the results you calculated for 13,000 CFS with a .2 diffusion velocity with 35,000 fecal coliform. That was 6,621 at the state line.
>
> A. I get 2,179.
>
> Q. That is after your die-off and that is after your dilution at the state line, is that right?
>
> A. That is correct. (Carter, TR. 8931)

Geldreich testified as to the significance of fecal coliform counts as follows.

> Q. With respect to the presence of salmonella and shigella and the opportunistic pathogens and E coli

and R-factor antibodies, how do we test for the presence of bacterial pathogens?

A. Routinely we do not test for bacterial pathogens because there is no one test, no one procedure available at this time that can adequately recover all known pathogens that may be in the polluted water. Therefore, we must go to the concept of using some kind of an organism which is very common in the intestinal tract of warm-blooded animals and use it as an indicator of the presence of fecal contamination in the water.

* * *

More recently, as I mentioned, I have been involved in the refinement of the old concept, what we call now total coliforms, as an indicator, and the refinement into this procedure, to be more specific, to those which are related to fecal material. We call these fecal coliforms. (Geldreich, TR. 3056-57)

Q. And with respect to the incidence of, let's say, single day values, you indicated to the Court that if you had, say, 1 to 70—was that the range you used on fecals—that you might have a 7 percent likelihood of a salmonella or some pathogen being present?

A. Salmonella.

Q. And as you went to 200——

A. We would have about 28 percent.

Q. And if you went to 1000, you would have——

A. 95 percent approximately.

* * *

Q. And the typical value that is used for bathing beaches or bathing waters is what number?

A. 200 per 100 ml fecal coliforms.

Q. That is normally as a geometric means, is it not?

A. Based on data collected over a period of 30 days, and during the bathing season, and so on.

Q. With respect to the individual day, if you had a level over 200, you would have a risk of pathogens being present, would you not?

A. Yes.

Q. And if you had high quality water that was relatively free of bacterial contamination, would you have any opinion as to whether we should allow individual days to exceed 200?

A. No. I have an opinion, but I do not like the approach where we will excuse the problems we have with slugs of pollution, which sometimes I am asked by the geometric mean. (Geldreich, TR. 3102-03)

Much of the talk about dilution is superfluous. Public water supply treatment plants reconcentrate pollutants on their intake filters. Dr. Wellings testified:

Q. Now, from the standpoint of raw water supplies, in your opinion, is it sufficient, based on your knowledge in the area based on looking at the Clark article, Defendants' Exhibit 34 which found solids coming through a water treatment plant, in your opinion, is it safe from a public health standpoint to rely solely on the water treatment plant to remove viruses?

A. We have got to go according to the rules of public health, and that is, to protect the water supply.

Your raw water supply needs to be protected in the greatest possible way, and as I said before, we are spewing out more and more effluent over the U.S.A. and until we get to the point where we reduce the virus

load and the bacterial load before discharge, we are going to be in a very sad shape.

* * *

Q. With respect to viruses in water, there has been a lot of talk about dilution here as being the solution to the problem, and you have heard the old refrain dilution is not the solution to pollution?

A. Right.

Q. With respect to viruses in water, assume we dump out large quantities of virus and we dilute it like mad. I mean, we put in all the water that is available to dilute it.

Would you tell the Court what happens when water is taken into a municipal treatment plant and run through filters?

* * *

A. You bring in raw water out of the lake and you are passing it over filters and it can be concentrated. It will be by all of the organic matter that is present there.

Then you have a breakdown or something happens, which happens all the time in treatment plants. There is a breakdown or the filter isn't functioning properly, and boom, it comes through as a concentrate, sludge.

By Mr. Karaganis:

Q. So a filter in a water treatment plant can take a large mass of water that is out in the lake and, as it runs the water through the filter, the small particles that are in that water can literally be concentrated on the water treatment plant incoming filters, is that right?

A. That is right. (Dr. Wellings, TR. 13,268-69)

Finding By The Court: Disease Hazard:

"Once these pathogens arrive in Illinois waters, they can infect and cause disease in residents of Illinois. This takes place in two ways: by ingestion of these waters at bathing beaches by swimmers and by ingestion of drinking water containing these pathogens. . . .

"In regard to the bathing beaches, I am satisfied that the persons who use those beaches cannot do so with safety if there are any significant numbers of viruses in the water. There is a question as to how many viruses it takes to cause an infection. I can't solve that one. The experts are not in agreement but I believe, first of all, from the evidence I have heard, that the number is small. If one virus is insufficient, it still need not be hundreds. Moreover, the evidence shows that any viruses which do reach Illinois waters are likely to do so in great numbers. (A. 34)

Dr. Melnick testified:

Q. With respect to persons who swim, can they pick up these viral infections?

A. Yes, if they have minor cuts or abrasions on their skin, if they get water in their mouth or nose, they could pick up the virus and become infected. (Dr. Melnick, TR. 2218)

* * *

Q. Doctor, we have talked about plaque form units or infectious units. How many infectious units does it take to infect the human being?

A. I think regardless of whether you are talking about a human being or cultures and so on, if you have susceptible cells and you have an infectious virus unit present, you can set up an infection.

Q. With a single unit?

A. With a single infectious unit.

Q. With respect to——

A. That doesn't mean a single unit always sets up an infection. It has to come in contact. For example, if you put an infectious unit on the surface of someone's skin, it may not set up an infection; but if you put it inside someone's mouth, that would set up an infection. (Dr. Melnick, TR. 2200-01)

Dr. Berg testified:

Q. With respect to the question of numbers, Doctor—and I am not going to go through with you a long litany of taking you from what the base case is and then percentages down—but let's just assume for the moment that we have 320 million gallons a day of sewage leaving the Milwaukee area and this is treated effluent, whatever the case may be, but it has, let's take, 10 plaque-forming units per liter.[22] (Dr. Berg, TR. 12094)

Q. Let's talk about the users of water along Lake Michigan and let's assume, whatever the dilution is, that this mass of water travels to Illinois, whatever dilution you want to assume.

A. I think any virus that man contacts is a potential hazard. An amount that great, I would say——

Q. Even if we talk about a low levels per gallon, what are we talking about when we talk about 320 million

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[22] To be conservative counsel for plaintiff selected an extremely low number of virus in the effluent. Dr. Wellings and Dr. Berg both testified as to the extremely poor viral removal efficiencies of secondary activated sludge plants. Given an average of 7000 viral units per liter, Milwaukee's daily discharge could be as high as 7000 viral units per liter.

gallons? If we talk about 10 per gallon, is that roughly 3 billion viruses?

A. This is about what you are talking about, yes.

Q. If we are just talking as low as 10 per liter coming out of there, we are talking in excess of 10 billion viruses a day?

A. More than that, I think. You are talking 10 per liter. That is about 40 per gallon roughly, and then you multiply that by 320 million gallons.

Isn't that the number you gave me?

Q. Yes.

A. 320 million?

Q. So we are talking in the billions or trillions?

A. Yes, I think so.

Q. From the standpoint—I realize that this is a method scientists use in terms of talking about systems in water in terms of concentrations per liter, but before when we were talking about a solid particle in solids, you talked about it as wet weight, numbers per gram.

A. Yes.

Q. From a public health standpoint, if we are talking about millions of viruses being discharged daily, is it appropriate to try to talk about dilution of those viruses, just letting them out and diluting them? Let's assume that they dilute to 1,000,10,000 [sic].

BY THE WITNESS:

A. The answer to that question is that what is really important is what impacts man, what contacts man, whether he is a swimmer or whether he is a possible ultimate consumer by way of drinking it.

I don't think that any viruses should be discharged to a water that man might contact.

By Mr. Karaganis:

Q. With respect to the removal of viruses and what we call this double tier of detection, would it be fair to characterize your previous testimony to say that in the sewage treatment plant, we ought to remove solids to the maximum extent possible, we ought to remove organics to the maximum extent possible, we ought to remove ammonia as an interference with effective chlorine disinfection?

A. Yes, if there is any likelihood at all that these materials in the effluents will eventually reach waters that man might consume.

The Court: How far would you go from an economic standpoint to achieve that?

The Witness: I think that is really a question the community has to decide for itself, but in terms of the potential public health hazard, I think any virus that you have at all is a potential risk. So I think that to the extent it is possible, you ought to remove all of the viruses that you can. (Dr. Berg, TR. 12096-12101)

Finding By The Court:

"There are fecal coliform counts on Illinois beaches which fail to demonstrate any pollution coming from Milwaukee, but again, that does not prove that viruses are not in the water." (A. 34)

To the extent this finding can be interpreted that there is no evidence of fecal contamination on Illinois beaches, plaintiffs would respectfully dispute such a finding. Lake County beach records show severe fecal contamination. (Plaintiffs' Exhibits 172 & 173). What the trial court ap-

pears to be finding is that the fecal coliform found on those beaches cannot be physically identified as Milwaukee fecal coliform.[23]

The trial court had ample evidence that low fecal coliform counts are no assurance that viruses are not present.

> Q. Dr. Berg, with respect to viruses, given all the problems we have with detecting viruses, and hepatitis we can't detect at all in water even though it may be there, if we have very low levels of fecal coliform which, as the Court knows now, is used as an indicator of bacterial pathogens, if we have, say, zero fecal coliform or 1 fecal coliform, does that mean we are free of viruses?
>
> A. No. We have detected viruses in waters occasionally when there have been no fecal coliform by standard tests. Moreover, it is quite possible, and we have managed to demonstrate this in the laboratory that you can chlorinate a primary effluent, for example, which contains fecal coliforms at levels at 10 to the 6th and 10 to the 7th of a hundred ML's, and chlorinate with a level of chlorine for a sufficient period of time

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[23] This same identity of pollutant source problem was addressed in *United States* v. *Ashland Oil & Transportation Co.*, 504 F.2d 1317 (6th Cir. 1974) where the court held:

> "The only remaining question of importance in this case concerns whether or not the government must bear the burden of establishing not merely that oil was discharged into a tributary of a navigable stream, but also that, in fact, the oil reached and polluted the navigable river. To state the question is to recognize the impossibility of such proof in many if not all cases. Drops (or barrels) of oil carry no fingerprints. At the juncture of the Pond River and the Green River water analysis which might show oil pollution could not possibly prove which polluter discharged it, in what proportion, or on what occasion. Nor where many offenders are involved in creating a great social problem is such proof constitutionally required." 504 F.2d at 1329.

can destroy all of the fecal coliforms measurable by standard techniques that still leave a certain proportion of the originally existing virus viable and demonstrable. (Dr. Berg, TR. 12083-84)

Finding By The Court:

"As far as the treatment plants are concerned, the testimony of Dr. Wellings convinces me that viruses do get through water filtration plants attached to and embedded in solids, which can go through the filters of those plants, both when the plant is being operated properly and even more so should the plant experience a breakdown." (A. 36)

The opinion of all public health experts was unanimous that we cannot rely on water treatment plants as an excuse to discharge contaminated water.

Dr. Wellings:

Q. Doctor, directing your attention to Defendants' Exhibit 34, I believe it is, which is the paper, "Virus Study for Drinking Water Supplies," by Clark, et al.; directing your attention to page 4——

* * *

Q. I think page 4 will allow you to see one of the problems here.

Directing your attention to page 4, one of the laboratories involved in the tests was the—what do they call it, the Gulf Coast Laboratories?

A. Gulf Coast sample—yes.

Q. With respect to the Gulf Coast laboratory, after they took the water from the treatment plant now,—this is after going through a treatment plant, isn't that right?

A. That is right.

Q. So after going through a municipal treatment plant with all of the typical methods of coagulation and filtration, et al., what problem did they find on their samples that they took from the Gulf Coast Treatment Plant?

A. Particulates were clogging the filters.

Q. Now, are you familiar with the methodology that they used?

A. Yes. I am very familiar with it.

Q. Did they analyze the viruses in those particulates?

A. They did not.

Q. So we had coming through a municipal waste treatment facility particulate matter, is that right?

A. Right.

Q. That particulate matter, based on your work, is one of the principal repositories for viruses, is that right?

A. That is right.

Q. But the material that was done by Clark, they did not analyze the particulates?

A. They did not.

Q. Now, Doctor, in your opinion, if a treatment plant let through particulate matter, a water treatment plant, in your opinion, can that particulate matter contain viruses?

A. Yes.

Q. With respect to that, if it lets particulate matter through, if particulate matter comes through the water treatment plant, can those viruses be protected from chlorine?

A. The only way that virus, as I see it, with the rigorous treatment that water is subjected to in a good

treatment plant, the only way that viruses can survive that treatment, there must be solids associated, and I don't mean adsorbed to. I mean being an integral part of.

Q. The solid?

A. The solid, right.

Q. Now, with respect to that data, based on what you know and based on the material you see there of particulate matter actually coming through a treatment plant, can we rely in your professional opinion on water treatment plants as being our single line of defense against viral contamination?

THE COURT: Excuse me. This was a water treatment and not a waste treatment?

THE WITNESS: That's water treatment.

MR. KARAGANIS: Water treatment, your Honor.

BY MR. KARAGANIS:

Q. It was a water treatment plant, your Honor, that they tested for viruses in water. They found particulate matter—correct me if I am wrong, Doctor.

They found particulate matter coming through the water treatment plant after all the treatment levels, is that right?

A. Right.

I might point out that other people have done the same thing and have found that drinking water in certain areas is more difficult to filter than some of the sewage, and this is in Texas.

Q. Why is that?

A. Work has been done.

I don't know why it is except that their raw water is so terrible to begin with, and the clean up is very difficult.

Q. Now, from the standpoint of raw water supplies, in your opinion, is it sufficient, based on your knowledge in the area based on looking at the Clark article, Defendants' Exhibit 34 which found solids coming through a water treatment plant, in your opinion, is it safe from a public health standpoint to rely solely on the water treatment plant o remove viruses?

A. We have go to go according to the rules of public health, and that is, to protect the water supply.

Your raw water supply needs to be protected in the greatest possible way, and as I said before, we are spewing out more and more effluent over the U.S.A. and until we get to the point where we reduce the virus load and the bacterial load before discharge we are going to be in very sad shape. (Dr. Wellings, TR. 13264-68)

Dr. Berg testified:

Q. Doctor, what is there about a water treatment plant in terms of getting hit with raw water contaminated with virus which would cause concern?

A. Well, if you are talking about the kinds of plants that they describe in these two papers, I think it probably makes no sense to be concerned about a virus hazard in the liquid portion of the water that is coming out of that plant with the chlorine residual of anywhere from 1 to 2 parts per million of free chlorine as they describe it, which means there is a substantial —even at the very high pH levels they sometimes use, there must have been a fairly high level of hypochlorous acid, which is a very fast killing chlorine, and with the low turbidities they had, except that one cannot be

sure that the material that is characterized as turbidity did not contain viruses, there is no way to know even with that small amount of turbidity which cannot be readily removed even by a well operated treatment plant.

Q. When you talk about turbidity, would you explain what turbidity is in terms of a substance? Is turbidity solids?

A. Solid coloidal material.

Q. By "coloidal material," would you please explain to the Court what that is without a detailed chemical explanation? What do we mean by "coloidal?"

A. Well, it is a form of suspended material.

Q. It is a very fine form of suspended material?

A. Yes.

Q. Very extremely small size?

A. It can be, yes. It would have to be quite small.

Q. Can that coloidal material encase or encapsulate solids?

A. Encapsulate viruses, do you mean?

Q. Or viruses rather.

A. I would expect it could, yes.

Q. Are there any other circumstances—that is in the normal operation?

A. Yes.

Q. There are circumstances with treatment plants with respect to the public health concern—well, I will go back a second.

They can operate at the level you have just described 100 percent of the time?

A. I wouldn't expect they would. If a treatment plant breaks down at some point in time for some period of time, even for a very short period of time, during that period of time when there is perhaps inadequate removal of the solid material, when there is lack of chlorination, then any impact that raw water coming in may have by way of pathogenic agents, viruses or anything else, can presumably become a problem.

Q. Doctor, are you familiar with the public health principle articulated in public health, particularly in the fields of microbiology and virology of a double tier protector?

A. Yes. The multiple barrier——

Q. Or multiple barrier theory?

A. —that we normally speak of, which means that you try to protect the raw water as much as you can so that in the event that something does happen at a treatment plant that you don't bring about an insult that can be carried through the plant and in this respect, carry through into the finished water pathogenic organisms or viruses. (Dr. Berg, TR. 12080-83)

Dr. Melnick testified:

Q. Doctor, can't we rely on water treatment plants to disinfect?

You mentioned reservoirs where we get our water. Do we have to worry about the reservoirs, or can't we rely on water treatment plants to disinfect or remove the viruses?

A. I think it is dangerous to rely on water treatment plants alone. We need water treatment plants, but if the load on the water treatment plant is excessive, then a virus may slip through.

The water treatment plants depend upon people who run them. There are all types of failabilities as far as human beings and mechanisms are concerned. The safest approach as far as human health is concerned is to keep virus as far away from the water treatment plant as possible.

That should be the measure of last resort, not first resort.

Q. With respect to the water treatment plants, have there been instances in the United States where viruses have gotten through water treatment plants and caused outbreaks?

A. There have been a number of outbreaks that have been documented by EPA as infectious agents spread by water. This is not easy to earmark as far as viruses are concerned because of the things we talked about earlier. There is usually a very high rate of sub-clinical to clinical infection. So it is difficult to know whether the clinical infection in the community ever had its origin in someone who drank the water or was he a contact of somebody who drank the water? Because it is so difficult to trace, it is difficult to get a concrete answer to such a question. (Dr. Melnick, TR. 2191-92)

Mr. Edwin Geldreich testified:

Q. Are you aware of instances where bacterial contamination has, by human inadvertence or breakdown of equipment or anything else, gotten through water treatment plants?

A. Yes, sir.

Q. Does that have any effect on your opinion that we ought to control it at the source?

A. That is why I am so concerned about the fact that we must control pollution at the source, because we

cannot rely on the water plant operation to handle the full load of the problem. (Geldreich, TR. 3106-07)

B

Eutrophication

Finding By The Court:

"I turn now to the second phase of the case, that involving the matter of accelerated eutrophication of Lake Michigan.

"I have no doubt whatever from the evidence in this case that the amount of phosphorus in Lake Michigan is increasing. No one knows how much phosphorus was in the lake 20 years ago, nobody knows how much phosphorus was in the lake yesterday; but what is clear from the evidence beyond any doubt is that when phosphorus is put into the lake, it stays there for a long time. It stays there either in solution in the water itself or in the bio-mass—in the algae, the organisms, both animal and vegetable, which use phosphorus in their life cycles—or it is in the bottom sediments, from which it can be recycled, that is, put back into solution over time." (A. 42)

Dr. Claire Schelske, a limnologist from the University of Michigan testified:

Q. [By Mr. Van Hecke] So today, as you sit here on the witness stand and I stand here before you, we have phosphorus that was put in that lake years ago that is still affecting that lake?

A. That is overstating what I have said in two ways. One is that if you would look at the increase of phosphorus input to the lake, you would discover that a large fraction of phosphorus that was added to Lake Michigan in historical times effectively has been added

within the last 30 years, and a lot of this has come for two reasons. One is increasing population—three things—increased sewering, and the third thing is the increased use of phosphorus in detergents.

All of these things added together means that the amount of phosphorus that got into the lake or could potentially get into the lake, has increased greatly, much greater than would be expected if you looked at any of those parameters individually. (Dr. Schelske, TR. 2973-74)

THE COURT: How does phosphorus, once in the lake, get out at all?

THE WITNESS: I guess really there are three main sources, three ways that you can lose phosphorus from the lake.

One is it can flow out through the Strait of Mackinac into Lake Huron. The second way it can get out of the lake, which really isn't going out of the lake at all, is to be sedimented to the bottom. This removes it from the water, but that doesn't mean that it can't be recycled from the sediment back into the water.

The third way it can be taken out of the lake is through some kind of a harvesting procedure. Say when these alewives were dying, if we were to pick up the alewives and gotten them out of the drainage basins, this would remove phosphorus. (Dr. Schelske, TR. 2974-75)

THE COURT: Actually, nobody is harvesting it, I take it, the third alternative?

THE WITNESS: No, there really isn't significant harvest.

THE COURT: So does most of it go to the Lake Huron or does most of it go down to the bottom? That is lost, I mean.

THE WITNESS: Again, this comes back to this long renewal time. We know that our salvation isn't to dump this stuff into Lake Huron because we are only taking 1 percent of the volume of Lake Michigan out every year. So that any that is left in the water, 99 percent of it is going to remain at the end of that year.

So this phosphorus that is put into the lake is certainly staying in that lake basin. It is either in the water or in the sediments or in the organisms that are in the water and sediments. (Dr. Schelske, TR. 2976)

THE COURT: Does it become dissolved when it is in sedimentary form over time?

THE WITNESS: It can. The benthos that live in the bottom of the lake can eat some of these organic materials that are sedimented to the bottom.

They are like any other organism, animal type organism. When they ingest materials, they excrete materials as well, and these excreted materials contain phosphorus. So some of it has to come back that way.

There are also chemical reactions that can take place in the sediments that will release phosphorus.

Again, coming back to this circular causal system, the greater the productivity in the system, the greater amount of relief of this particular nutrient from the bottom. So that by accelerated eutrophication, you tend to intensify some of these processes. (Dr. Schelske, TR. 2979)

Dr. Schelske described the process of eutrophication as follows:

Q. [By Mr. Karaganis] Doctor, let's see if we can get some nomenclature straight. What are phytoplankton?

A. Phytoplankton are the microscopic plants that are suspended in the water. They are free floating organisms. (Dr. Schelske, TR. 2818-19)

Q. Doctor, with respect to phytoplankton populations, you have mentioned three general categories. I think you mentioned the diatoms, the blue-green, and what was the third category?

A. Green algae.

Q. In discussing or categorizing lakes and their concentrations or quantities or relationships of these various types of algae, is it typical to refer to the trophic status of the lake?

A. Yes, that is true.

Q. That is t-r-o-p-h-i-c?

A. Yes.

Q. What do we mean by the trophic status of a lake?
A. In terms of nutrients, this refers to the degree of nutrient enrichment of the water. In limnological terms, we have oligotrophic lakes, which have the fewest concentrations of nutrients, the smallest concentration of nutrients, and there is a gradation of lakes then to those that are termed eutrophic. These are the lakes that have the highest concentration of nutrients.

Q. When you say the highest concentrations of nutrients, is there a relationship between the concentration or the load of nutrients and the amount of plant growth or algal growth that is there?

A. Yes, that is true. In fact, generally speaking when people talk about eutrophic or oligotrophic, they are really talking about the quantity of biological materials present in the lake, rather than the concentration of nutrients because the biological system is the one that responds to the nutrient inputs. So in the oligotrophic lakes we have very small population, small concentrations of phytoplankton, and at the other extreme in this system, in the eutrophic lakes, we have the largest concentrations of phytoplankton organisms.

Q. From the layman's standpoint, is it the organisms or the concentration of nutrient that physically manifests itself as the condition?

A. It is the organisms themselves.

Q. What physical manifestations would a layman see if he looked in an oligotrophic lake?

A. I think what the layman sees, first of all, in an oligotrophic lake is something that they think of as being clean, and this is characterized by very blue water, by clear water, and probably less objectionable growths or smaller growths of organisms along the shorelines and on piers and things of this type.

Q. What you refer to as clear water, is that water that, if you are on the surface, you can see down for some depth?

A. Right, as an example, in limnology we have what is termed a secchi disc, which is a disc that is about eight inches in diameter, which we lower into the water on a line that is calibrated and watch it until it disappears from sight. In Lake Superior, under very good conditions, you can see this down to depths greater than 60 feet; whereas in some of the eutrophic areas of the Great Lakes, you will maybe see this at depths of less than six feet. So it is something that is very, very obvious.

Q. This murkiness or turbidity, what is that murkiness that we associate with oligotrophic? What is causing that?

A. As you get away from——

THE COURT: Oligotrophic?

MR. KARAGANIS: I am sorry, eutrophic.

By the Witness:

A. As you get away from the shoreline where there may be some influences due to suspended inorganic materials, this is almost entirely due to the biological components of the system or their byproducts. The biggest part of this is, of course, phytoplankton.

By Mr. Karaganis:

Q. Is the turbidity or the murkiness then due to the number of organisms, biological organisms, phytoplankton that are then present in the water?

A. Yes, it is due to the concentration of those organisms.

Q. What causes those organisms to be present in the water in these numbers?

A. It is adequate supplies of nutrients, abundant supplies of nutrients.

Q. Would it be fair to say for those who don't fertilize lakes normally, but fertilize lawns or gardens, that phytoplankton respond in general terms just as what we experience in terms of doing our lawns or gardens?

A. Yes, I would say that is a very similar situation.

Q. The more fertilizer we put into the lake or nutrients we put into the lake, the better crop we grow, is that right?

A. As long as the nutrients are supplied in the right portions.

Q. Now, what would be the symptoms of a eutrophic lake? You mentioned one, the color change from blue to green and from clear to murky water. What other symptoms would there be?

A. As I said, you would notice—you would have more objectionable growths of plant organisms on surfaces,

substrates, stringy filaments on the piers and rocks along the beach, and in severe cases there would be materials that would wash up on the shore during storms. There would be a smell associated with the water, and when the water is deep enough, these materials that are produced by excessive plant growth settle to the bottom and deplete the supplies of oxygen, creating an anoxic condition in the water. (Dr. Schelske, TR. 2821-26)

Q. Based on your evaluation of the data found around the Milwaukee vicinity, as well as your own work throughout Lake Michigan, do you have an opinion as to whether Lake Michigan is suffering from a condition of accelerated eutrophication?

A. Yes. I think it is suffering from that.

Q. And with respect to the cause of that accelerated eutrophication, is there a particular nutrient which is primarily responsible for the enriched status?

A. Yes. We have called that a controlling element, which is phosphorus. (Dr. Schelske, TR. 2883-84)

Finding By The Court:

"The evidence of the accelerated eutrophication is the decrease in dissolved silica, which I find is due to its utilization by diatoms; a decrease in the diatom population; and an increase in blue-green algae, both in the in-shore zone and the off-shore zone." (A. 44)

Dr. Schelske testified:

Q. With respect to Lake Michigan, have you studied the processes of nutrient enrichment and the status or the trophic status of Lake Michigan?

A. Yes.

Q. Are we seeing anything on Lake Michigan at this time which in any way resembles the sequential process that you described on Lake Erie, namely from nearshore to whole lake, or expanding into the lake?

A. Yes. I think a case can be made that all of these things are happening in the lake.

Q. With respect to the process of eutrophication, as you described it, what is it if anything is happening in Lake Michigan that leads you to state that these processes or this process of eutrophication is occurring in Lake Michigan?

A. There are actually two things that come to mind immediately on that. One is the increased algal abundance that has been observed at the water filtration plant at the city of Chicago over some 50 year span.

The other more convincing story, and one that encompasses the whole lake, is the phenomenon that we have called silica depletion in the lake. This relates back to what we discussed earlier, that as the diatom standing crops get larger and larger in the lake, they consume more and more of the silica that is present in the lake, until eventually you have depleted the silica, creating a situation where silica is limiting in the lake.

We see this manifested in Lake Michigan.

Q. I think you mentioned in terms of the process of eutrophication that in the continuum of occurrence, there is first the development of a large bio-mass of diatoms, which exhausts the silica, and then, having exhausted the silica, they become limited by that exhausted supply and allow other organisms, such as blue-greens, to become dominant, is that right?

A. Yes. That's right.

Q. Have you seen any evidence of this species dominance of blue-greens that you have described as characteristic of the eutrophication process present in Lake Michigan?

A. Yes, we have observed this throughout the lake actually.

Q. When you say you have observed it throughout the lake, has it first manifested itself in any particular portions of the lake; in other words, where does it show up first?

A. It is going to show up first in the near-shore zones and then will spread to the offshore parts of the lake.

Q. Would it be fair to say the southern end of Green Bay and western Lake Erie are considered the classic examples of eutrophication in the Great Lakes?

A. I think to people familiar with the Great Lakes work, that would be very true.

Southern Green Bay hasn't gotten the publicity in the newspaper that western Lake Erie has.

Q. With respect to the process of silica depletion and the changeover, have you seen any data or reviewed any reports with respect to the development of this process in the Milwaukee Metropolitan area?

A. Yes, I have actually examined a couple of sources.

Q. This process that you described of eutrophication, the exhaustion of the silica, the shift in species dominance from diatoms to blue-green, is that often referred to as a process of accelerated eutrophication?

A. Yes, it has been.

Q. When you say you have reviewed data with respect to the Milwaukee Metropolitan area, I show you what has been marked as Plaintiffs' Exhibit No. 144, a paper or report by A.M. Beeton and James Barker.

Have you reviewed the paper?

A. Yes.

Q. I show you what has been marked as Plaintiffs' Exhibit 2, a two volume work entitled "An Environmental Study of the Ecological Effects of Thermal Discharges from Point Beach, Oak Creek, and Lakeside Power Plants on Lake Michigan."

Have you reviewed that document as well?

A. Yes, but I would have to confess that I haven't read every page of it.

Q. Have you reviewed data from that document?

A. Yes.

Q. Did the Beeton paper, Plaintiffs' Exhibit 144, involve a study of the lake in any particular area?

A. This was centered around the Oak Creek power plant.

Q. Where is the Oak Creek power plant?

A. It is located south of Milwaukee.

MR. KARAGANIS: For the record, your Honor, in Plaintiffs' Exhibit 144 at page 72, there is a map showing the location of the Oak Creek power station which was the subject of this study.

BY MR. KARAGANIS:

Q. With respect to Plaintiffs' Exhibit Number 2, "An Environmental Study of Ecological Effects of Thermal Discharges from Point Beach, Oak Creek, and Lakeside Power Plants on Lake Michigan," was that also a study of power plants on the Wisconsin side of the lake?

A. Yes.

Q. Is the Oak Creek referred to in Plaintiffs' Exhibit 2 the same Oak Creek power plant?

A. Yes.

Q. Point Beach, is that to the north of Milwaukee?

A. Yes.

Q. Lakeside is right in the Milwaukee breakwater, is it not?

A. It is in that vicinity. (Dr. Schelske, TR. 2854-56)

Q. Directing your attention to Plaintiffs' Exhibit 144, would you read what Dr. Beeton had to say about the phosphorus concentrations found in Lake Michigan near the Oak Creek power plant?

A. He says, this report says:

"The near-shore phosphorus concentrations were within the range usually reported for Lake Erie and Green Bay."

Q. When you say Lakie Erie and Green Bay, are those the two locations you previously identified as being associated with the problem of eutrophication in the Great Lakes?

A. Yes. (Dr. Schelske, TR. 2877)

By Mr. Karaganis:

Q. Dr. Schelske, I show you volume II of Plaintiffs' Exhibit 2, the study by the Wisconsin Electric Power Company. I ask you whether or not there was any information contained in this study that indicated the existence or non-existence of this eutrophication process in the Milwaukee area?

A. Yes. It indicates that a problem does exist.

Q. What data is that, to your best recollection?

A. Again, there is the data we talked about previously, which was increased chlorophyll concentrations, increased standing crops or phytoplankton, depletion of silica, and high total phosphorus concentrations. Also, the species composition shift that I talked about earlier.

Q. With respect to the conclusions reached—and for the record, if we can, I should like to identify the date of this study, which is listed as September 1974, your Honor—would you read, directing your attention to page 10.049, the conclusion reached by the Wisconsin Electric Power Study as to the eutrophic conditions or the existence of eutrophic conditions in the Milwaukee area?

A. Where is that?

Q. The last paragraph there.

A. "Beeton states that increased phytoplankton abundance, increasing length of maximum populations, and decreased periods of low populations, coupled with increased abundance of blue-green algae and changes in dominant flora are indicative of eutrophication. Comparison of our data with those of earlier studies (Beeton and Holland, 1972; Stoermer and Kopinska, 1967; and FWPCA, 1968) indicates that Lake Michigan near Milwaukee is undergoing accelerated eutrophication." (Dr. Schelske, TR. 2879-80)

Q. Before we get into the situation in the Milwaukee area, when you describe the near-shore/offshore environments, or you use the terms, would you describe what the near-shore environment means in terms of nutrient loadings to Lake Michigan, in other words, the effected areas?

A. The near-shore, as we accumulate more information, it looks like the near-shore is probably a zone that is defined by physical features within the lake, and primarily one of these features is the morphometric features or the topography of the bottom.

One of the breakpoints that has been used in this case is a 40 meter contour, approximately 120 feet deep. The near-shore then would be that zone from the lake's edge out to 40 meters or 120 feet.

Q. With respect to that near-shore zone from a nutrient and chemistry standpoint, what does that mean in terms of the input of nutrients and their travel in Lake Michigan?

A. Mos of the nutrients that are put into the lake come from sources on the shore or from tributaries that empty into the lake along the shoreline. So that means that the nutrients have to be processed in the near-shore zone before they ever reach the main part of the lake.

Q. When you say have to be processed in the near-shore zone, is that near-shore zone, from what you described it, shore parallel?

A. In general it would be, yes.

Q. Would it be fair to say then that it is the near-shore zone that receives the brunt of the nutrient inputs?

A. Yes, that is true. That is why we see the in-shore/offshore differences that people talk about in the literature of the Great Lakes.

Q. With respect to those in-shore/offshore differences, when you talk about the in-shore, is that the zone that first saw the effects in Lake Erie of progressive eutrophication?

A. Yes.

Q. When we use that term in-shore zone for Lake Erie, we are talking about a zone similar to the zone in Lake Michigan?

A. You are talking about the area of the lake closest to the shore. I am not sure if the 40 meter contour holds true there.

Q. When we talk about the in-shore zone which goes around Lake Michigan and we talk about nutrient inputs to the lake, do scientists, in discussing the eutrophication problem, break down Lake Michigan into Illinois' Lake Michigan and Wisconsin's Lake Michigan and Michigan's Lake Michigan and Indiana's Lake Michigan?

A. No, I am afraid we don't.

Q. Is it valid from the scientific perspective, from the standpoint of eutrophication of Lake Michigan, to consider the lake as a series of territorial fifedoms [sic] controlled by individual states?

A. No.

Q. From the standpoint of eutrophication of Lake Michigan, is the problem of nutrient inputs at one location a cumulative problem for the entire lake?

A. Yes. (Dr. Schelske, TR. 2861-63)

Q. The manifestations of blue-green to date that you have studied have manifested themselves in the fall, is that right?

A. Yes.

Q. And they are manifesting themselves now throughout Lake Michigan, this dominance of blue-greens?

A. Yes.

THE COURT: Would that be true in the center of the lake as well as in the coastal zones?

THE WITNESS: Yes. (Dr. Schelske, TR. 2186)

Finding By The Court:

"Accelerated eutrophication results in taste and odor problems in the lake water. In an advanced state, this odor problem can affect the use of the water for recreational purposes, and even in a less advanced stage, it can cause problems with drinking water." (A. 44-45)

Dr. Schelske testified:

Q. And with respect to drinking water, as this eutrophication process goes on, was there any drinking water problems in Lake Erie's experience?

A. We have drinking water problems in Lake Michigan of similar types. The clogging of filter runs. We have to increase the amount of filtering needed to prepare drinking water. Taste and odor problems exist from large standing crops of algae. Some of the phytoplankton give off organic substances that impart a taste or odor to the water that is fishy or smells like dirty clothes. (Dr. Schelske, TR. 2924-25)

Mr. Robert Goodin, Director of Public Works of the Village of Glencoe testified as to just such a taste and odor attack:

Q. Mr. Goodwin, have you had occasion recently within the Village of Glencoe to have a situation where the customers, the public, the citizens who drink from Glencoe's water supply, were subjected to taste and odor problems from the raw water supply?

A. Yes.

Q. Recognizing that a treatment plant operator cannot always anticipate what he is going to receive, in the recent past, have you had situations where the taste and odor problem because of inability to anticipate the problem has actually gone through the water treatment plant and into the distribution system?

A. Yes, we have.

Q. You have had cusomers who have complained about taste and odor?

A. Yes, we did. (Goodin, TR. 13521)

Q. With respect to that, will you state for the Court what this recent episode was in your own words?

A. It was about the—it was the weekend preceding the July 4th weekend that we first got the taste, and our staff then called and found that neighboring towns had the same problem, and we had, I think, within about a week's time—we had about 20 calls that we had recorded at least where people had called about the taste in the water.

Q. These are customers?

A. Customers calling.

Q. Who are drinking water from their taps?

A. Yes. (Goodin, TR. 13525)

Q. So about the fourth or fifth day of this episode, you got to the point where you could get the taste out of the water?

A. Yes.

Q. What did City of Chicago Lab inform you as to the source of this taste and odor problem?

A. They said it was the dinobryon.

Q. The algae dinobryon.

A. Yes. (Goodin, TR. 13530)

Finding By The Court:

"In addition to the odor and taste problems caused by eutrophication, there is a loss of the clarity of the water, which is an aesthetic value important to many people, and I think rightly so. A secchi disc in Lake Superior can be seen at a depth of 60 feet. In Lake Michigan it can be seen at a depth of 10 to 15 feet only. Lake Superior is an ologotrophic [sic] lake. Lake Michigan is becoming a lake which exhibits the turbidity typical of lakes inhabited by increasing populations of algae." (A. 45)

Dr. Schelske testified:

THE COURT: You mentioned that Lake Superior has places where you can see down 60 feet or so. Does Lake Michigan have any such places.

THE WITNESS: In my experience, we have encountered that once at one particular spot in the northern part of the lake, in April or May.

The more typical values in Lake Michigan would be something like 10 feet or 15 feet. (Dr. Schelske, TR. 3009)

Finding By The Court:

"The accelerated eutrophication caused by these nutirient inputs is far greater in the in-shore zone than it is in the off-shore zone, but there is no reason to believe that the eutrophication found in the in-shore zone will not spread, and, if not stopped, that it will not spread clear across the lake." (A. 46)

Dr. Schelske testified:

> Q. How does this nutrient input from the coastal zone get out to the center of the lake?
>
> A. Well, this is a process that is a physical process primarily. The nutrients are introduced into the near-shore zone and are maintained there for some period of time, and eventually by various physical processes in the lake are mixed with the mid-lake waters, and during the wintertime at least we have fairly homogeneous conditions in the lake, when the lake is not thermally stratified, is free to circulate from top to bottom, and we have the highest periods of wind.
>
> Q. So you get your nutrients that you put in over a period of time mixed into the lake, into the lake center, is that right?
>
> A. This is a gradual process.
>
> Q. And with respect to the contribution of phosphorus by Milwaukee, at different periods of the year or throughout the year would Milwaukee's contribution of phosphorus stay at Milwaukee?
>
> A. No. It would be distributed both up and down the coast as well as to some extent out into the middle of the lake, depending on the season of the year. (Dr. Schelske, TR. 2886)

Finding By The Court:

> "In any event, I believe that one million pounds of phosphorus from the treatment plants alone, without considering additional phosphorus discharged by the overflows, is a significant input to the lake, and its removal would be a significant removal. We know that Milwaukee is the biggest point source on the lake and that, of the total point sources on the lake, the Mil-

waukee discharges constitute a substantial percentage." (A. 5-52)

Dr. Schelske testified:

Q. Is there a particular substance or waste product that has a greater proportion of readily available phosphorus than the non-point diffuse source?

A. The source that would have the most readily available phosphorus and the greatest proportion and also the highest concentrations would be sewage.

Q. And with respect to sewage, is there anything else about sewage and its discharges, the discharges of sewage, which enables the phytoplankton to accept the nutrients, to absorb them rapidly?

* * *

A. Yes. Because of the nature of sewage, it is a very good substance to promote growths of organisms that derives from biological materials, various decomposition products. So in essence what sewage is, at least various components of it, is a very rich nutrient broth, if you want to use that term, for biological organisms. So sewage contains a lot of essential materials required for the growth of plants. (Dr. Schelske, TR. 2888-89)

Q. Now, with respect to this, if we were to take this so-called total load on the lake, with respect to the total sewage load on the western side, we have Milwaukee at about 60 percent?

A. Yes.

Q. Total sewage load on the lake about 50 percent?

A. Yes. (Dr. Schelske, TR. 12929)

Q. Doctor, on the basis of your analysis of loads to Lake Michigan, to the western shore of Lake Michi-

gan, would you state what in your opinion is the most significant loading of phosphorus?

A. The most significant source on the western shore is Milwaukee. (Dr. Schelske, TR. 12935-36)

Finding By The Court:

"I find from what I believe is clear and convincing evidence that the defendants' sewage discharges into Lake Michigan are presently contributing in a substantial way to the accelerated eutrophication of the in-shore zone of the western shore of Lake Michigan, including waters of Lake Michigan which are within the territorial boundaries of the State of Illinois.

"I find further, on the basis of clear and convincing evidence, that due to the interchange of waters in the in-shore and off-shore zones, the defendants' discharges, if continued at anything like present levels, will substantially contribute to the accelerated eutrophication of Lake Michigan as a whole, including waters within the territorial boundaries of the States of Illinois and Michigan. (A. 55-56)

Dr. Schelske had testified how the nearshore nutrients moved into the central lake as a whole (see testimony p.94 *supra.*). Dr. Alfred Beeton, Director of the Great Lakes and Marine Water Center at the University of Michigan, has done exhaustive research on the eutrophication of the great lakes, especially Lakes Michigan and Erie. In this work he has performed extensive analyses of eutrophication on the western shore of Lake Michigan. Dr. Beeton testified:

Q. Now, having laid that foundation, based on your experience in Lake Michigan and based on what is coming out of Milwaukee in the form of sewage discharges, are those discharges having an effect on the eutrophication of Illinois waters of Lake Michigan?

A. Well, to answer that I would say that inputs of the magnitude coming out of Milwaukee certainly affect the eutrophication process of the in-shore waters, and from that standpoint I in turn would say that anything that affects the eutrophication of the in-shore waers of the lake also will affect Illinois.

Q. Thank you, Doctor. Why is that?

A. Because there is a movement of water from place to place in the lake, since waters are not static. (Dr. Beeton, TR. 12653-54)

In summary the trial court found that plaintiffs had proved the existence of a nuisance both as to a public health hazard and as to eutrophication. The trial court also found that defendants' actions violated the Illinois Environmental Protection Act.

"For the foregoing reasons, the court finds the issues on the question of liability in favor of the plaintiffs and against the defendants on all three counts of the complaint." (A. 59)

As discussed above the judge's decision is overwhelmingly supported by the record.

III

THE REQUIREMENTS OF JUDGE GRADY'S DECREE AND EVIDENCE IN SUPPORT OF THE DECREE

Judge Grady divided the remedial measures into two major areas:

(1) collection of raw sewage overflows, and

(2) treatment of all sewage flows once collected.

As to raw sewage overflows the court ordered:

"As far as the wet weather flows are concerned, the witnesses for both sides were in agreement that over-

> flows of raw sewage to Lake Michigan cannot be tolerated and must cease. I find that to be the fact. Whether the defendants agree to it or not, the discharge or raw sewage into the lake must cease. (A. 59)
>
> "As far as the method is concerned, I am not going to get into the sanitary engineering business yet, and I hope that I will never have to. From the evidence that I have heard, it seems to me the sensible thing to do is collect, transport, and treat." (A. 60)

As Mr. Dale Lundy of Alvord, Burdick & Howson (Milwaukee's long-term engineering consultant) stated on adverse examination:

> Q. And from a professional engineering standpoint, isn't the safest and least health hazardous alternative to collect and treat such sewage rather than to let it pour into basements or into rivers?
>
> A. That would be considered preferable, yes. (Lundy, TR. 907)

Mr. Donald Weiland, Chief Engineer for the sewage commission, also testified on adverse examination:

> Q. As a design engineer responsible for designing sewers with adequate hydraulic capacity, do you consider it sound sanitary engineering practice to design and install overflow devices which are intended to permit the discharge of raw sewage as a permit solution to hydraulic overloads on an interceptor system?
>
> A. Certainly not. (Weiland, TR. 201)

Turning to the matter of treatment levels which should be achieved at the treatment plants the court found:

> "The effluent standards that should be sought are 5 milligrams per liter of BOD and 5 milligrams per liter of suspended solids." (A. 61)

"I am satisfied from the testimony of Dr. Wellings and other witnesses that unless there is a good removal of solids and a free chlorine residual there is not an adequate kill of viruses." (A. 36)

The evidence to support the need and reasonableness for this performance standard has already been discussed in substantial part in the preceding discussion. However to avoid any doubt about the broad evidentiary support for the judge's order it is set forth here as well.

Dr. Wellings testified:

Our aim in St. Petersburg is to reduce solids to a 5, Jackson, JTD, Jackson Turbidity units, which is less than, I think probably 5 milligrams per liter of solids.

Then that gives you the opportunity to have an effective chlorination. (Dr. Wellings, TR. 12396)

THE COURT: If you have say 5 milligrams per liter of solids, does that help the chlorine remove or kill the viruses associated with those solids more than would be the case if say you had 30 milligrams per liter?

THE WITNESS: Well, the problem with 30 milligrams per liter is you are going to have a lot of organics tied up with solids that is going to use up your chlorine, and the chlorine can't even get into.

THE COURT: I see. So the fewer solids, the less chlorine is used up in other ways.

THE WITNESS: That is right, and that is the reason if you get it down low enough you will have enough active chlorine that can really get to the solids. (Dr. Wellings, TR. 12398)

Q. Doctor, whenever we are finding high solids well, is it your opinion that even at 30 milligrams per liter of solids that we have a problem with disinfection?

A. I think you would still have a problem with disinfection.

I really don't know how I would equate Jackson Turbidity Units with milligrams, you know, because you would have to know size, shape, and all that, source, because of the test itself; but I would say 5 milligrams per liter would be well in the ball park.

* * *

THE COURT: What do you mean by that phrase? Do you mean that would be what you would desire?

A. Well, I wouldn't want anymore than that.

THE COURT: You would not want anymore than that.

THE WITNESS: I would prefer much less, but I wouldn't want anymore than 5.

BY MR. KARAGANIS:

Q. So if we could perform at a maximum of 5 but consistently there would be ones and twos, would that be it?

A. Yes. (Dr. Wellings, TR. 12401-02)

Edwin Geldreich testified:

Q. With respect to the question of BOD, which you indicated interfered with the chlorination process, do you have any opinion as to how low we should get the BOD?

A. As low as possible.

Q. If you could achieve four milligrams per liter BOD through an advanced waste treatment facility, would that be desirable from the standpoint of chlorination?

A. Yes, sir.

Q. With respect to removal of solids, you indicated the solids problem being the encapsulation situation, with respect to effective disinfection through the use of chlorine, do you have any suggestion as to the level that you would want to have for solids?

A. Five milligrams per liter would be desirable.

Q. When you say five milligrams per liter, if that were achievable at an advanced waste treatment facility, would you approve of such a standard?

A. Yes, sir. (Geldreich, TR. 3090-91)

Dr. Berg testified:

Q. So, if we have got fecal material or any other materials surrounding the viruses and you put chlorine on it, will that kill it?

A. The chlorine isn't going to penetrate very far. It is not going to kill embedded virus.

Q. Would it be fair to say that in order to have effective chlorination of the material that you are chlorinating, you should remove the solids?

A. That is correct.

Q. With respect to the organics, do you also try and remove the organics?

A. Yes. You would want to do that in order to prevent or reduce the formation of the compounds that are less effective. (Dr. Berg, TR. 12068)

Berg testified that plant effluents of 50 or 100 mg/1 BOD or suspended solids—which defendants admit they could

discharge on any day and still meet their desired average[24] —would have no virus removal. (TR. 12118-20)

Gordon Culp testified as to the desirability of coagulation/sedimentation followed by filtration:

> Q. When you talk about coagulation and setting combined with filtration, you get a very stable, very uniform, very low concentration of contaminants in the effluent, is that right?
>
> A. That is right. It is very consistent. You are no longer dependent on the gravity separation, only of a very light flocculent biologic material, biologic material which can vary in its setting capabilities from day to day. Now you have very positive control with the solids.
>
> Q. Let me just ask this.
>
> You were a trained engineer dealing with an activated sludge plant—were you very conscientious about its performance?
>
> A. Yes.
>
> Q. You wanted it to do the best job it could, isn't that right?
>
> A. Yes.

---

[24] Defendants' witness Katz admitted:

> Q. Just for example's sake, if I were to take a discharge of 100 milligrams of BOD from the Jones Island treatment plant, based on this permit you could have and still meet your 30 days and still meet your seven days, you could have discharges of 100, can't you?
>
> A. And still meet the monthly——
>
> Q. Yes.
>
> A. —or weekly——
>
> Q. Yes.
>
> A. —average, yes.

> Q. Now despite your trained engineering supervision of that plant, were you able to get a consistently low solid and BOD out of the activated sludge plant?
>
> A. No.
>
> Q. Are the upsets in an activated sludge plant something that you can predict? Can you sit back and say, "We are going to have a bad day tomorrow?"
>
> A. No, you certainly cannot. There are some conditions, of course, which will occur which will allow you to predict that, but the normal operation, no. (Culp, TR. 13006-07)

Culp did a calculation of the cost of coagulation/sedimentation and filtration and testified that the average homeowner would pay less than $2 a month for the total capital cost and operating cost of the facilities even without federal grants.[25]

This is exactly the same treatment recommended by defendants' own engineering consultant—Alvord, Burdick & Howson. They recommended coagulation/sedimentation plus filtration (TR. 753-54; Plaintiffs' Exhibit 91). In 1976 Alvord, Burdick & Howson wrote a letter to their client, the defendant Sewerage Commission stating:

> Effluent requirements are continually becoming more stringent. For illustration, Waukesha has just been advised that its *effluent must meet BOD of 4, and S.S. of 5 ppm.* If EPA stays in existence, *I think the time is not far distant when effluents discharged to the Great Lakes will have requirements of that order.* We

---

[25] Milwaukee's own fiscal witness Heaps estimated that the average cost per household to finance Milwaukee's entire program—sewers included—would cost less than an average of $6 per month per household without any federal aid. (Defendants' Exhibit 1348, Item 13).

> are just now finishing a very complete, sophisticated plant at Roanoke, Va., which has requirements that are *even more rigid than those above mentioned.* (Plaintiffs' Exhibit 74, emphasis added)

Alvord, Burdick's letter was correct. Hammond, East Chicago, and Gary, Indiana are being required to install filters with discharge requirements identical to Judge Grady's 5 mg/1 solids and 5 mg/1 BOD. (Plaintiffs' Exhibit 273.) Cities such as Washington, D.C., Chicago, and Dallas are also adding filtration facilities to their activated sludge plants. (TR. 13002-04)

CONCLUSION

This memorandum has only scratched the surface of a mountain of evidence mandating judicial relief against defendants' massive fecal discharges. The sheer vastness of this record prohibits further elaboration at this time. Plaintiff again respectfully draws necessary attention to the "clearly erroneous" standard of Rule 52. *See, Barnes* v. *St. Catherine's Hospital,* 563 F.2d 324, 329 (7th Cir. 1977); *Indiana State Employees' Ass'n, Inc.* v. *Negley,* 501 F.2d 1239, 1241-42 (7th Cir. 1974).

But more important than any procedural question are two fundamental questions of fact and law:

> 1) Will this Court condone the continual corruption of Lake Michigan by letting Milwaukee use the lake as its cesspool?
>
> 2) Will this Court honor the centuries old utility of public nuisance as an effective tool for the protection of the public health and welfare?

The peril or protection of generations dependent on Lake Michigan for their physical and aesthetic sustenance will turn on this Court's answers to these questions. Plaintiff State of Illinois respectfully urges this Court to clearly and aggressively affirm the District Court's decision and judgment order.

Respectfully submitted,

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Joint Memorandum of Defendants-Appellants City of Milwaukee, The Sewerage Commission of the City of Milwaukee and The Metropolitan Sewerage Commission of the County of Milwaukee to the United States Court of Appeals for the Seventh Circuit

IN THE UNITED STATES COURT OF APPEALS
FOR THE SEVENTH CIRCUIT

No. 77-2246

PEOPLE OF THE STATE OF ILLINOIS, *Plaintiff-Appellee,*

and

PEOPLE OF THE STATE OF MICHIGAN,
Intervening Plaintiff-Appellee,

vs.

CITY OF MILWAUKEE, THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE, and THE METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE,
Defendants-Appellants.

Appeal of the United States District Court for the Northern District of Illinois, Eastern Division
Honorable John F. Grady, Presiding

JOINT MEMORANDUM OF DEFENDANTS-APPELLANTS CITY OF MILWAUKEE, THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE and THE METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE

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INTRODUCTION

This memorandum responds to the supplemental memorandum filed by plaintiff-appellee State of Illinois pursuant to this Court's order of May 26, 1978.[1] The May 26 order stated:

> "[T]he appellees are directed within thirty (30) days from the date of this order to serve and file a memorandum setting forth (1) their position as to the elements required to be proved [to establish a nuisance under the federal common law]; (2) the transcript of Judge Grady's oral decision, identifying therein the particularized findings deemed material to such issues, and supplying by footnotes to said transcript record citations of evidence which appellees contend supports such findings; and (3) record citations to evidence which appellees contend supports the reasonableness and necessity of the standards adopted in a final decree."

We do not understand the May 26 order to permit either party to brief its case again. For that reason, we have not responded in full to the legal argument included in the supplemental memorandum submitted by Illinois and we specifically rely on the briefs previously filed herein by defendants. Instead, this memorandum delineates the elements which must be proved to establish a federal common law nuisance (Part I); describes where and if the lower court found those elements, and describes where and if the record below supports those elements found by the lower court (Part II); and describes the boundaries of relief which may be granted (Part III).

In responding to Illinois' supplemental memorandum, we mention by way of introduction a number of points

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[1] Intervening plaintiff-appellee State of Michigan simply supports the memorandum filed by Illinois.

which Illinois has either incorrectly analyzed or failed to consider altogether.

First, the supplemental memorandum *nowhere* even mentions—much less discusses—the Federal Water Pollution Control Act, as amended, 33 U.S.C. § 1251 *et seq.* ("FWPCA"), or the administrative regulations and discharge permits issued pursuant thereto, even though federal case law is clear that relevant federal statutes and regulations are the first and principal place to which federal courts refer when seeking to determine applicable federal common law. Instead, Illinois incorrectly asserts that (i) *Illinois* v. *Milwaukee*, 406 U.S. 91 (1972), simply directed the lower court to exercise "informed judgment" (Supp. Memo. pp. 8, 24), and (ii) the Supreme Court has adopted the common law of England and of the various states as the federal common law (Supp. Memo. pp. 9-13). Illinois' unjustified disregard of existing federal statutory and regulatory law reflects the incorrect legal reasoning underlying the lower court's decision. Illinois and the court below have chosen to ignore the principle adopted by the Supreme Court that: "If there is a federal statute dealing with the general subject, it is the prime repository of federal policy and a starting point for federal common law." *Wallis* v. *Pan American Petroleum Corp.*, 384 U.S. 63, 69 (1966).

Second, the supplemental memorandum fails to identify and address each evidentiary element needed to prove a public nuisance under federal common law. Much attention is paid to the character of defendants' discharges into Lake Michigan at Milwaukee; somewhat less attention is paid to the potential transport of such discharges into Illinois waters and the possible contents and condition of such discharges when, if ever, they arrive in Illinois waters; but absolutely no evidence is cited which establishes a necessary proximity to Illinois water intakes or to Illinois beaches of pathogens which move to Illinois waters from

Milwaukee, if any, and no evidence is cited which shows that there is any actual effect on people in Illinois (which effect would result if the cause or hazard were present). Note that defendants do not argue that an effect must be shown *if a hazard is proved;* the position is that the absence of effect negates and *disproves the existence* of any hazard. This void of evidence is critical since no health hazard can exist unless pathogens are transported close enough to the Illinois shore to be ingested by swimmers or drawn into the intake of an Illinois water treatment plant.

Third, it is evident from Illinois' supplemental memorandum itself that there is no evidence to support the reasonableness and necessity of the standards ordered by the lower court. The "evidence" said to support the standards ordered by the lower court is nothing more than generalized guesstimates of treatment levels which would be "desirable" as a general matter. These guesstimates were given by people who are not sanitary engineers and know nothing about the site-specific Milwaukee-Illinois situation, and were given without *any* particularized consideration of the relative benefits and disadvantages of alternative treatment levels, or the relative costs of such treatment levels.

Fourth, the failure of proof in this case is due not only to specific and crucial gaps in the chain of circumstances which must be proved to establish a federal common law nuisance, but also to Illinois' studied reliance upon speculation after speculation even though hard evidence could and should have been adduced if the nuisance claimed by Illinois were actually present. Illinois (i) did not test for the presence, much less the behavior and life span, of viruses *anywhere* in Lake Michigan, (ii) did not test for bacteria *anywhere* in Lake Michigan (except to determine whether Illinois beaches should be closed, and those tests have proved essentially negative since Illinois' *own* north shore point sources stopped discharging into the lake),

(iii) did not test for *any* health impacts which might be associated with swimming in or drinking water from Lake Michigan, (iv) did not conduct *any* test for viral and bacterial inactivation achieved by water treatment plants in Illinois, and (v) offered *no* evidence as to the reasonableness and necessity of imposing upon defendants a 5/5 standard 25 miles away at Milwaukee rather than the 30/30 standard prescribed by defendants' discharge permits. Instead, Illinois has deliberately chosen to rely upon a series of speculations about the actual facts, even though the true actual facts could and should have been established by hard evidence. As discussed below, without such evidence, no federal common law can be established.

A final important introductory comment is that contrary to Illinois' basic position, the general common law rule is that what is authorized by statute or license cannot be a *public* nuisance, although such license does not necessarily preclude liability for *private* nuisance. 58 AmJur.2d *Nuisances* §§ 228-229; *Commerce Oil Refining Corp.* v. *Miner*, 281 F.2d 465, 468 (1st Cir.), *cert. denied*, 364 U.S. 910 (1960); *Urie* v. *Franconia Paper Corp.*, 107 N.H. 131, 218 A.2d 360, 362 (1966); *First National Bank in Albuquerque* v. *Nor-Am Agricultural Products, Inc.*, 88 N.M. 74, 537 P.2d 682, 686-87 (1975) (as insecticide was manufactured pursuant to authority granted by the federal government, its manufacture does not constitute a nuisance); *Commonwealth* v. *Glen Alden Corp.*, 418 Pa. 57, 210 A.2d 256 (1965) (court could not entertain common law public nuisance suit claiming that noxious fumes were injuring the health and well being of state's residents, where Air Pollution Control Act was designed to regulate this very problem); *Borough of Westville* v. *Whitney Home Builders, Inc.*, 32 N.J. Super. 538, 108 A.2d 660, 663 (1954), *aff'd*, 40 N.J. Super. 62, 122 A.2d 233 (App.Div. 1956) (discharges from sewage disposal plant could not constitute public nuisance where discharges were approved by State Department of Health pursuant to legislative authority); *Boccardo* v. *United*

States, 341 F.Supp. 858, 865 (N.D. Cal. 1972); *Township of Cherry Hill* v. *New Jersey Racing Commission,* 131 N.J. Super. 125, 328 A.2d 653, 664, *aff'd,* 131 N.J. Super. 482, 330 A.2d 600 (App.Div. 1974), *cert. denied,* 68 N.J. 135, 343 A.2d 423 (1975).

This is the rule in Illinois, *People ex rel. Scott* v. *Continental Can Company, Inc.,* 28 Ill.App. 3d 1004, 329 N.E.2d 362 (1975) (summary judgment for defendant in suit by Attorney General to enjoin air pollution and alleged public nuisance, since defendant had a permit and was in compliance with emission limitations imposed by statute and Pollution Control Board),[2] and is the federal common law rule. *Potomac River Association, Inc.* v. *Lundeberg Maryland Seamanship School, Inc.,* 402 F.Supp. 344, 359 (D. Md. 1975) (Corps of Engineers permits authorizing dredging and filling foreclose recovery for public or private nuisance for injuries occurring from activities under the permits); *Northern Transportation Co.* v. *City of Chicago,* 99 U.S. 635, 640 (1879):

> "A Legislature may and often does authorize and even direct acts to be done which are harmful to individuals, and which without the authority would be nuisances; but in such a case, if the statute be such as the Legislature has power to pass, the acts are lawful and are not nuisances, unless the power has been exceeded."

Committee for Consideration of Jones Falls Sewage System v. *Train,* 539 F.2d 1006, 1009 (4th Cir. 1976) (states in strong language that federal common law cannot proscribe

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[2] *Costas* v. *City of Fond du Lac,* 24 Wis.2d 409, 129 N.W.2d 217 (1964) (Ill. Supp. Mem. p. 18) involved a private nuisance action. *People ex rel. Scott* v. *United States Steel Corp.,* 40 Ill.App. 3d 607, 352 N.E.2d 225 (1976) (Ill. Supp. Mem. p. 19) did not address the question. The question there was whether the primary jurisdiction and exhaustion doctrines precluded a nuisance suit during the pendency of an EPA NPDES hearing.

that which the 1972 FWPCA amendments legitimate); *City of Georgetown* v. *The Alexandria Canal Company*, 37 U.S. 91, 97 (1838); *Cf., Sanitary District of Chicago* v. *United States*, 266 U.S. 405, 432 (1925) (injunction against diversion of Lake Michigan granted, without prejudice to any permit that may be issued by the Secretary of War according to law).

I. FACTORS WHICH MUST BE PROVED TO ESTABLISH A FEDERAL COMMON LAW NUISANCE

First, the *federal* law which governs federal common law nuisances must be identified. The starting point is the *Erie* doctrine that there is no body of generally applicable federal common law. Thus, since this case is governed by the *federal* common law, *Illinois* v. *Milwaukee*, 406 U.S. 91 (1972), it must of necessity fall within one of the exception areas in which *federal* common law may exist, i.e., for the purposes of this case, the *federal* common law must be supplying interstices in federal statutory and regulatory law or it must be supplying a uniform federal court-promulgated rule where there is an absence of statutory or regulatory law. *Id.* at 103-105 n. 5-7.

It is therefore necessary to start with the federal statutory and regulatory scheme. If that be complete, there is no office for the *federal* common law to perform except to interpret and apply the federal statutory and regulatory law. If the statutory and regulatory law is not complete then the federal courts may also supply the missing elements and then interpret and apply the statutory and regulatory scheme as augmented.

We have previously briefed our contention that the federal statutory provisions and the permit system established and operated thereunder establish the parameters to which effluent discharges must conform and which define the requirements which *federal* common law may impose.

In essence, we stated the following propositions. There is no question but that *federal* statutory and regulatory law exists governing effluents that are discharged to interstate waters. There is no question but that this case deals with effluent discharges into interstate waters. Thus, we looked to the statutory and regulatory federal law to determine what controls are imposed upon dsicharges of effluent to interstate water and then to federal court interpretations thereof and federal court determinations supplying interstices therein or, where they fail to reach an area, supplying missing areas of control. On that basis we postulated the proposition that our permits controlled our effluents and the federal judiciary was limited thereby in framing a remedy here. OF COURSE, AN *administrative* AVENUE IS OPEN TO PLAINTIFFS TO CHANGE THOSE PARAMETERS BY INTERVENING IN THE PERMIT PROCEEDINGS, BUT PLAINTIFFS HAVE CHOSEN TO PROCEED UNDER THE FEDERAL COMMON LAW WHICH ACCEPTS THOSE PERMIT PARAMETERS AND IS LIMITED THEREBY.

However, to meet the Court's Order, we here address the delineation of the elements of a "federal common law nuisance" by assuming *arguendo* that the federal statute and the permits issued thereunder do not so define both the required conduct and the *federal* common law remedy. However, even in such an approach the important impact of the adoption of the federal statute after the Supreme Court had decided the lead cases involving interstate water pollution is clear. As noted previously, "If there is a federal statute dealing with the general subject, it is the prime repository of federal policy and a starting point for federal common law." *Wallis* v. *Pan American Petroleum Corp., supra* at 69. This is what Judge Tone referred to as "the doctrine of the common law of the statute" at oral argument.

Federal courts, in promulgating federal common law, are bound under the doctrine of *stare decisis* by the decisions of the appellate courts in the *federal* system which exercise appellate jurisdiction over them. They are not bound by,

but may look to, the decisions of courts in the federal system which do not exercise appellate jurisdiction over them and they may likewise look to the decisions and rules of state law, though they are again not bound thereby.

We see no basis in a federal common law nuisance case for departing from the fact that traditionally, and as a fundamental requirement, the first inquiry a federal court makes is directed to its jurisdiction. Two challenges appear in the record before this Court to its jurisdiction. The first was decided by Judge Bauer in *Illinois* v. *Milwaukee,* 4 E.R.C. 1849 (N.D. Ill. 1972) (and preserved for this appeal) wherein he held (against contentions that the venue locus of a nuisance action is the place of perpetration rather than the place of result, and that municipal corporations such as the defendants are legally incapable of existing or being subject to process outside their own geographical limits) that the U.S. District Court in Illinois not only was a proper venue for the trial of a nuisance action involving a nuisance whose alleged perpetration is clearly outside Illinois, but that the municipal corporation defendants, all creatures of the sovereign state of Wisconsin, were susceptible to service of process by that court. The second jurisdictional challenge is that of the County of Milwaukee which asserts in this Court that it was a necessary and indispensible party not joined below. While we believe these are necessary points for plaintiffs to surpass in order to sustain jurisdiction and venue for the holding below, we will not dwell on them but will proceed directly to the delineation of the substantive elements of a federal common law nuisance, as we mentioned, assuming *arguendo* that the federal statutes and regulations are not totally controlling.

There are few cases which define a federal common law nuisance. Fortunately, such cases predominate in the precise area of our concern, namely interstate waters and possible health hazards. We believe that the only relevant line of cases binding on this Court is that referred to by

Justice Douglas in *Illinois* v. *Milwaukee, supra,* including *Missouri* v. *Illinois,* 200 U.S. 496 (1905); *Missouri* v. *Illinois,* 180 U.S. 208 (1901); *New York* v. *New Jersey,* 256 U.S. 296 (1921); and *North Dakota* v. *Minnesota,* 263 U.S. 344 (1923).

These Supreme Court cases stand for some general propositions which in turn contain the elements of a federal common law nuisance. These cases say that a federal common law nuisance has two elements:

1. The existence of a right, and
2. The substantial unjustified interference with that right.

In addition, these cases make it plain that proof of these requisite elements may not depend upon the speculations of experts; instead, such proof must be clear and convincing.

In terms of the nuisance alleged here, and the facts in evidence, the federal common law as established by the Supreme Court of the United States in the cited cases is clear and may be outlined as follows.

A. A Right Must Be Shown To Exist In The Plaintiff.

1. Plaintiff Illinois asserts a right to freedom from exposure to a health hazard.
2. Both plaintiff states assert a right to be free from accelerated eutrophication.

In respect to the health hazard claim, the cases of *Missouri* v. *Illinois* and *New York* v. *New Jersey* certainly have an inherent assumption that such a right exists and defendants do not challenge the existence of such a right. However, the right is not absolute in the sense that it can be merely asserted and relief follows as of course. The claimed interference with the right must also be shown.

B. A Substantial Unjustified Interference With An Established Right Must Be Shown.

1. Mere deposit of effluent into interstate water is not sufficient, *Missouri* v. *Illinois, supra; New York* v. *New Jersey, supra.*

    a. The test for effects of health hazard is at the site where the complaint is made, *id.*

        (i) This means showing

            (a) deposit in water of pathogens

            (b) transport of pathogens

            (c) existence of pathogens at site of complaint

            (d) effect of pathogens

                (I) exposure

                (II) infection

In *Missouri* v. *Illinois,* 200 U.S. 496 (1905), Missouri sought to restrain Chicago's discharge of sewage into the Des Plaines River, which emptied into the Illinois River and thence into the Mississippi River 43 miles above St. Louis. Missouri claimed, *inter alia,* that Chicago's sewage discharges so poisoned the Mississippi River as to make it unfit for drinking, agricultural or manufacturing purposes.

Missouri's chief contention was that St. Louis had experienced an increase in typhoid fever deaths (which it had), and that typhoid bacillus contained in Chicago's sewage discharges survived the journey from Chicago to the St. Louis water intake. There was conflicting expert testimony as to the time and distance within which the stream would purify itself. Comparing the number of deaths in St. Louis before the operation of the Illinois system to that after, the Supreme Court concluded that the grounds for an inference of harm were very narrow since there had been no increased rate of typhoid along the banks of the Illinois

River. The Court (i) concluded that it was uncertain how much pollution was due to Chicago and how much to sources further down river not complained of by plaintiff, (ii) noted that plaintiff had to take preventative measures at St. Louis (filtration, etc.), against the dangers of plaintiff's own creation (or from sources other than Illinois), (iii) determined that such preventative measures would protect against Illinois sources as well as those not complained of, and (iv) denied injunctive relief.[3]

The factors relevant to ordinary injunction analysis also are relevant to the balancing of equities required for purposes of imposing a remedy.

Certainly, the above propositions delineating the approach to a nuisance claim based on an asserted health hazard are even more applicable to the somewhat nebulous

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[3] *Reserve Mining Co.* v. *EPA*, 514 F.2d 492 (8th Cir. 1975), discussed at some length in the Illinois memo is not in point for purposes of traditional common law analysis. The court expressly noted n. 71, p. 529) that it was not there concerned with nonstatutory common law doctrines, and that most common law nuisance cases involving alleged harmful health effects require that present harm or an immediate threat of harm be established, citing, *e.g.*, *Missouri* v. *Illinois*. Note that in *Reserve Mining* the court dealt with asbestos fibers in drinking water. Asbestos fibers were a suspected carcinogen, the effect of these fibers would not be known for a number of years and was likely to be catastrophic both in number of people affected and in the type of effect, cancer. Here we have an alleged hazard, involving known diseases with short incubation periods, which hasn't occurred in a century of alleged exposure. The cases are wholly different. In the first an unknown exposure against which no protection existed was presented. Here the enteroviral and bacterial diseases that Illinois conjectures to be possibly present are subject to fail-safe and time honored protection in the form of chlorinating *drinking* water, the principal concern of the case, and closing breaches if pollution is detected, a measure which has not been necessary since Illinois stopped its own north shore discharges. Def. Ex. 1383 and 1384) In *Reserve Mining* the court had to fashion a remedy, here sanitary engineers have been providing an adequate, effective, and usual solution for years.

proposition of a right to be free from accelerated eutrophication "occurring over geologic time." (A-Ap. p. 49)

Illinois law is consistent with the above approach. In *City of Chicago* v. *Commonwealth Edison Co.*, 24 Ill. App. 3d 624, 321 N.E.2d 412 (1974), Chicago sought to enjoin the operation of Edison's Hammond, Indiana electric generating facility, alleging that the emissions from the company's stacks (sulphur dioxide, smoke, particulate matter, dust, fumes and other gases) constituted a nuisance under Illinois common law.[4] The appellate court affirmed the trial court's conclusion that the evidence did not establish a common law nuisance. The court noted that equitable relief usually is denied where the right to relief is doubtful under the law or facts, and that injunctive relief will be denied unless substantial harm or injury is clearly demonstrated. The court held that the city had failed to answer the threshold question of whether the Indiana facility caused "substantial harm" since, among other things [5] (i) plaintiff's evidence as to ground level concentrations of sulphur dioxide and particulate matter was not expressed in terms of time, so as to be compared with federal standards, (ii) defendant offered credible testimony demonstrating that its Indiana facility's contributions to sulphur dioxide and par-

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[4] Interestingly, the trial court held that Chicago could not seek to impose its emissions ordinances with respect to the Indiana facility. This holding apparently was not appealed.

[5] The court noted that early cases recognized a public right to clean, unpolluted air, but that the notion of "pure" air has come to mean clean air consistent with the locality and circumstances. Factors relevant in determining whether an industrial operation is an unreasonable interference with the right to clean air are: (1) the extent of injury or harm to the public health, safety, peace and comfort; (2) comparison of the operations methods or effects to prescribed standards outlined by applicable federal, state or local regulations; (3) suitability of the industry's location; (4) balancing of gravity of the harm done to the public against the utility of the defendant's business to the community as a whole.

ticulate matter ground level concentrations were below the levels proscribed by federal regulations, and (iii) the city could not clearly establish that the Edison plant was the direct cause of harmful pollution in Chicago—i.e., could not distinguish emissions from that facility from those of other sources located in the area.

In the case before this Court, as detailed in Part II *infra*, the evidence not only fails to show a substantial unjustified interference with Illinois' right to be free from a health hazard, it fails to show *any* interference and it fails to show a health hazard. The evidence on this element, or the lack thereof, may be outlined as follows (citations are provided in Part II, *infra*):

A. No tests for viruses in Lake Michigan were made.

(i) None were made at Milwaukee

(ii) None were made in Illinois waters

(iii) Viruses can be tested for and found

B. No tests for bacterial pathogens were made in Lake Michigan.

(i) None were made at Milwaukee

(ii) None were made at Illinois

(iii) Bacterial pathogens can be tested for and found

(iv) Tests for fecal coliform were run by defendants

(a) No high counts in Illinois

(b) Come from sources other than humans

C. No Illinois beaches have been closed since the north shore point sources *in Illinois* stopped discharging to Lake Michigan.

(i) Milwaukee discharged both before and after the north shore point sources *in Illinois* stopped discharging to Lake Michigan.

D. No outbreak of water borne disease or infection has been shown in Illinois.

(i) Such diseases are known

(ii) Such diseases have short incubation periods

(iii) Test programs could have been, but were not, utilized by plaintiff to determine existence.

E. Proof of *pathogen* transport was not addressed.

(i) No viruses were shown *anywhere* in Lake Michigan. There was merely an assumption that some of the viruses that are known to exist in human waste get into Lake Michigan in Milwaukee's discharges.

(ii) No bacterial pathogens were shown *anywhere* in the lake. There was merely an assumption that some of the bacterial pathogens that are known to exist in human waste get into Lake Michigan in Milwaukee's discharges.

(iii) The *only* direct evidence relied on by plaintiff to show actual presence of pathogens in Illinois waters is *low* fecal coliform counts on Illinois beaches.

(iv) Principal reliance as to transport was upon expert opinions that postulated currents of sufficient speed and duration to transport *water* and "*pollutants*" from Milwaukee to Illinois.

(a) The distinction in the testimony between conservative and non-conservative pollutants was disregarded by the court below

(b) Non-conservative pollutants (pathogens) are subject to

(I) Die off

(II) Predation

(III) Sedimentation

(IV) Dilution

(V) Ultra violet radiation

(c) No witness testified that pathogens *could be* or *were* transported from Milwaukee to Illinois, surviving *all* of the *above* impediments to transport.

II. THE LOWER COURT'S FINDINGS AND THE SUPPORT, OR LACK THEREOF, IN THE RECORD FOR SUCH FINDINGS

A. Transport

At pages 56-60 of its supplemental memorandum, Illinois has identified the following excerpt from the lower court's oral decision as a finding that viable pathogens are occasionally transported from Milwaukee to Illinois waters:

> "These pathogens, once they are discharged to the lake, are on occasion transported by the currents to the waters of the State of Illinois. We know this for several reasons. First of all, both sides concede that on a number of occasions throughout the year, there are currents of sufficient speed to transport from the Milwaukee area pathogens which will still be alive when they reach the Illinois state line." (A-Ap. p. 28)

1. *The Lower Court Did Not Distinguish—As It Should Have—Between Conservative and Nonconservative Pollutants.*

Unlike the trial court, and unlike Illinois in its brief and supplemental memorandum, the witnesses were careful during trial to distinguish between "conservative" and "nonconservative" pollutants and the difference in the way they behave and persist in a body of water.

Defendants' witness—Dr. Zanoni

"A. A conservative pollutant is a very general way of describing a class of pollutants that would be discharged in the receiving water. It merely means this, that they tend to conserve themselves and remain unchanged after discharge.

A good example of a conservative pollutant would be a simple salt, sodium chloride or calcium sulfate, the type of material you would find commonly in storm water runoff. This material virtually comes into the lake or river or any receiving body of water and is unrelated with time.

The only way that this material is removed or can be taken out of a particular body of water is by currents or some type of flow out of the body of water that is a conservative pollutant.

In contrast to this is what we refer to as a nonconservative pollutant. The nonconservative pollutant is a type of pollutant that changes or is altered or degrades with time or dies off with time or tends to disappear with time. It is a changing type of pollutant.

* * *

Another example of a nonconservative pollutant is something like fecal coliform organisms. Fecal coliform organisms are normally not indigenous to the aquatic environment, like a lake. If they are introduced into the aquatic environment, they change with time, meaning they die off or they disappear or they actually undergo what is called a process of extinction, they die off with time.

That is nonconservative. They are not conserved. The environment causes a change." (Tr. p. 3980-3981)

Mr. Harry Carter explained why one may not equate the behavior or persistence of conservative pollutants (like dye

used to track currents) with the behavior or persistence of nonconservative pollutants (like pathogens).

> "The concentration of dye and the concentration of coliforms are reduced by several processes. Both of them are subject to dilution by diffusion.
>
> In addition, the coliforms are subject to additional factors which cause their disappearance, let's say.
>
> Sometimes they settle out—sedimentation.
>
> Sometimes they are eaten by another organism.
>
> Sometimes there are not enough nutrients in the water to support them.
>
> But over and above any decrease in concentration due to dilution, there is an additional disappearance which is termed the die-away rate or disappearance rate." (Tr. pp. 8586-8587)

In contrast to nonconservative pollutants, which are subject to many factors, conservative pollutants are subject only to dilution. Plaintiff's witness Dr. Gabriel Csanady explained:

> "Most tracers and many pollutants retain their chemical identity in the lake environment for long periods: Such substances are called conservative, because their total mass remains conserved, whatever its distribution over the lake's horizontal and vertical dimensions. When a quantity of conservative substance is introduced into the lake it gradually spreads over a larger and larger region. Because its mass is conserved, the substance's concentration at the center of the cloud must decrease in time; the cloud must become more and more diluted." (Pl.Ex. 20, p. 107)

The distinction between conservative and nonconservative pollutants is crucial if one is to avoid confusing the

question of the transport of water with the transport of materials which are subject to environmental factors other than dilution. The lower court failed to avoid such confusion; the supplemental memorandum filed by Illinois encourages this Court to continue that confusion.

Illinois has repeatedly so used a quote from defendant's expert witness, Dr. Pritchard, that this distinction is lost. Illinois used the quote at pages 15 and 24 of its original brief. It was also used at page 60 of Illinois' supplemental memorandum. At page 15 of the Illinois brief the quote was used to argue that "pathogens" discharged at Milwaukee would move to Illinois waters. This is the quote upon which Illinois relies:

> "Q. There is no question that everything you have seen indicates that a substance which is placed at Milwaukee will reach Illinois waters, isn't that right?"
>
> "A. Correct, at some frequency." (Tr. p. 7175)

However, a review of the transcript immediately preceding the quotation shows that Dr. Pritchard was specifically limited by Illinois to considering only conservative pollutants, viz:

> "By Mr. Karaganis: Q. Doctor, just briefly if we have a substance that is one that we are concerned not with concentration but with total pounds, okay?"
>
> "A. Right." (*Id.*)

It is this limitation that is immediately followed by the quoted question and answer, viz:

> "Q. There is no question that everything you have seen indicates that a substance which is placed at Milwaukee will reach Illinois waters, isn't that correct.
>
> A. Correct, at some frequency." (*Id.*)

When Illinois' attorney repeats the answer as a question, Dr. Pritchard immediately responds with the four instances he had found that *water* parcels go to Illinois in single-phase excursions, viz:

> "Q. At some frequency.
>
> A. And our data to date is four instances during the year that we——" (Tr. p. 7176)

Illinois' attorney then changes the inquiry to include multiple excursions of water, viz:

> "Q. No, doctor, I am sorry. As to the four instances, your [Def. Ex. 905] data is a single phase excursion. That doesn't include data in which there was a reversal and then the water moved back down again, isn't that right?
>
> A. That is right, and that kind of look at the data is certainly pertinent." (*Id.*)

At this point, Dr. Pritchard attempts to introduce the concept of non-conservative pollutants, viz:

> "Q. Thank you, doctor, and you haven't made that kind of a look at the data?
>
> A. No, and the reason we didn't is because we began adding days and die off becomes more and more important." (*Id.*)

Illinois' attorney immediately requires Dr. Pritchard to stay on the subject of *conservative* pollutants, viz:

> "Q. But die off with a pollutant, where we are talking about pound loads that doesn't die off——
>
> A. Right, not if we are talking about something other than things like coliform, something that was conservative. Then it would be desirable to do the kind of——" (*Id.*)

* * *

Illinois' attorney then clarifies the fact that the subject of this line of questions and answers is *conservative pollutants,* viz:

> "Q. Doctor, with respect to a pollutant which isn't going to degrade, the time at which that pollutant or the number of times, the number of excursions, that that pollutant would come down under your experiments now would be greater than four times, isn't that right?
>
> A. I would presume so, yes, sir." (Tr. p. 7177)

When Illinois specifically limits a question to pound loadings i.e., conservative pollutants, it is not in position to cite the question and answer as dealing with non-conservative pollutants, to wit, pathogens.

During the trial, witnesses and attorneys would often use the term "pollutants" with the context determining the type of pollutant being discussed. Thus, in many instances in which the term "pollutants" was used, whether they were talking about conservative or nonconservative pollutants is defined by the context. As a result of that practice, great care has to be used in interpreting portions of the transcript or exhibits in the record, lest the term "pollutant" be automatically associated with the concept of a pathogen, be it bacterial or viral.

This identification problem was illustrated at oral argument during an exchange between Judge Tone and Mr. Elwin Zarwell, appellants' attorney. Judge Tone asked whether appellants are not being "overly broad" to claim that there is no direct evidence or testimonial opinion in the record which indicates that viable pathogens are or can be transported from Milwaukee to Illinois waters, taking into account all of the factors in Lake Michigan adverse to pathogens. Judge Tone referred to Dr. Csanady's "testimony" in plaintiff's exhibit 20, twice cited by Illinois to the effect that pollutants introduced in the inshore zone have

an influence zone of the order of 100 km. along the shore in either direction (Ill. Supp. memo. p. 58; Ill. brief p. 15). In his question Judge Tone appeared to use the term "pollutants" interchangeably with the term "pathogens". Dr. Csanady, however, used the term pollutants in Plaintiff's Exhibit 20 only in the sense of *conservative* pollutants, as a review of that document shows. For example, the process by which a 100 km. "influence zone" is said to occur is explained:

> "The local concentration of a conservative pollutant in Lake Michigan depends on the rate at which some discharged batch mixes with ambient waters and thereby expands in size." (Pl. Ex. 20 p. 103)

> "In view of the intimate connection between flux and dilution, it is more or less equivalent to refer to diffusion as 'cloud growth,' 'spreading out of a tracer,' 'dilution of a pollutant,' 'mixing of a substance with ambient fluid,' or 'entrainment of ambient fluid into a tracer cloud.'" (*Id.* p. 107)

Illinois' use of the quote from Csanady in its original brief under the section entitled TRANSPORT OF PATHOGENS TO ILLINOIS WATERS fails to reflect the expert's distinction between conservative and non-conservative pollutants, and, we believe, gives rise to confusion on the issue of transport of pathogens.

Like Illinois' submissions to this Court, the trial court's oral decision failed to distinguish between conservative pollutants and such nonconservative pollutants as pathogens.

> "First of all, both sides concede that on a number of occasions throughout the year, there are currents of sufficient persistence in a southerly direction and of a sufficient speed to transport from the Milwaukee area pathogens which will still be alive when they reach the state line." (A-Ap. p. 28)

No such concession occurred. In fact, defendant City of Milwaukee's attorney, Michael McCabe, stated during closing argument:

> "Now, no one has presented us with a model that tells us not only how or what in that model dilutes, but no one has shown us a model of what happens, let's say to the bacteria once they get into the lake; and bacteria do not maintain themselves in water in the same manner as water does. To the extent that they are attached to solids, solids will settle. To the extent that they are attached to organic material, and I think almost by definition they are attached to organic material as fecal material is to [sic] organic material, and any attachment that they develop in the secondary aeration basins is also organic material.
>
> To the extent that they are attached to organic material they are food. They are food to zooplanton in the water column. They are food to macro-benthic organisms on the bottom. They are food to macro-benthic organisms such as pontoporia that move up and down in the water column although they are basically located at the bottom. They are also food to small fish which take in organic material. Now, no one has attempted to model what is going to happen between the point where they are discharged into the river or into the lake from the plants. They have told us what gets into the lake, and they have told us what will happen in terms of die off, that is, death as a function of temperature. We have also not been told in any, I think, scientifically respectable manner how many bacteria in fact are in a plume that leaves the harbor." (Tr. pp. 13991-13992)
>
> * * *
>
> "Of course that is diluted into the river and settled out in the river to a certain extent, settled out in the harbor, settles out in the lake. It is also impacted by

any chemicals that are in the discharge, and is impacted by any predators that are seen on the lake. So although we have a model it is missing a number of things that I think are really needed to determine what in fact gets down to Illinois." (Tr. p. 13993)

* * *

"The problem with Dr. Csanady's model and indeed Dr. Pritchard's model in anybody's model is that they didn't know how much was coming out. They didn't know what was in it. They didn't know what happened to it when it got out. They didn't know what happened to it in terms of anything except the pure dilution values when it got down to the Illinois state line, and they never verified it under any conditions." (Tr. p. 14020)

On page 60 of its supplemental memorandum Illinois cites certain testimony of defendants' witness Carter in support of the lower court's finding of pathogen transport. That testimony, however, was addressed only to the behavior in water of *conservative* pollutants (i.e., effluent indicated by a patch of dye), and provides no support for the idea that viable pathogens are or could be occasionally transported to Illinois waters. For example, the following exchange occurred immediately before the testimony quoted in Illinois' supplemental memorandum:

"In two instances you indicated that the center of the dyed plume or patch would not have reached the Illinois state line but because of a certain forward dilution you felt that the leading edge might have gotten there?

A. That is correct, the material will diffuse ahead of the plume that is being released or rather somewhat ahead of the center of mass of the first parcel release." (Tr. p. 8671)

Illinois' citation of testimony in which the dispersion and dilution of a plume of water is traced by use of a conservative dye provides no support for the proposition that non-conservative pathogens reach Illinois waters from Milwaukee.

2. *Plaintiffs Have Failed To Prove That Viable Pathogens Are Or Could Be Transported From Milwaukee To Illinois Waters.*

There is no demonstrative proof that viruses are transported from Milwaukee to Illinois, and no witness gave an opinion of such transport taking into account the adverse factors found in Lake Michigan which will affect viruses. The *only* element considered by the plaintiffs with respect to viruses other than dilution was the effect of temperature.

Plaintiffs' witness Melnick testified:

> "Q. Doctor, do viruses die in the environment? If we dump viruses in the environment, do they die off?
>
> A. Yes.
>
> Q. How long a time are we talking about for enteric viruses to die off?
>
> A. It depends upon the time of the year. It depends upon temperature. As there is temperature fluctuation this varies a good deal.
>
> Q. Let's take the summertime with water temperature at 70°.
>
> A. I would say it would probably take about two weeks for it to die off.
>
> Q. Is that a range or [are] there longer times?
>
> A. It ranges. A virus may persist for months actually, and as you get into cooler weather, it will persist for an indefinite period of time.

Q. With respect to the viruses does each individual virus species or category have its own length of time that it persists?

A. More or less all the enteroviruses behave in a similar fashion." (Tr. p. 2199)

The fact that a variety of factors will adversely affect pathogens other than dilution or temperature was introduced early in the case by plaintiffs' witness Csanady.

"MR. KARAGANIS: Q. With respect to the concentration that you begin with and the concentration that you end up with, is there a factor other than dilution that can reduce the concentration?

A. Yes, for bacteria there is, of course the natural death process or other processes involving bacteria from the effluent such as other animals eating them. I am not familiar with the biological details, but I know that in calculating diffusion of bacteria one uses a decay factor or die off factor, from which it is possible to estimate what numbers of bacteria survive for a given length of time." (Tr. pp. 2047-2048)

However, once he introduced the concept of "other processes involving bacteria from the effluent such as other animals eating them" Csanady was brought back to limiting his testimony to die off related to temperature.

"Q. With respect to hydraulic transport and diffusion have you ever used or are you aware of standard engineering calculations which are used to calculate the die off rate for bacteria?

A. Yes, Mr. Karaganis. This is a textbook material. It is mentioned in a number of texts including the one that you brought here that I have written. It is common practice to describe the observed rate of bacteria, ob-

served die off rate of bacteria by a factor proportionate to the concentration so that the rate at which they die is proportionate to the number that is present.

* * *

Q. Is it correct that the rate at which bacteria will decay in terms of the equation that is used for die off, depends upon the water temperature selected for the analysis?

A. I am not really very well versed in the details of this but I have been using curves produced by people who are more familiar with the details of the situation. I know that generally they present the die off rate as a function of temperature.

Q. With respect to your calculations of die off in a situation of Milwaukee, did you use a particular die off equation?

A. I used a particular die off rate taken from a paper by Cannoli and others, which is quoted in the Envirex Report." (Tr. pp. 2049-2050)

The problems associated with predicting the survival of pathogens to the Illinois state line based upon the die off equations and coefficients "quoted in the Envirex Report" (Ex. 85 p. 74) which take into account *only temperature* (thereby ignoring sedimentation, predation, and other factors in the lake adverse to pathogens) is illustrated by the following exchange with the defendants' witness Carter. Note that Carter in his calculations used a dieoff or disappearance rate which took into account all factors affecting dieoff as found in defendants' tests run at Milwaukee. This is in contradistinction to the dieoff rates used by Illinois' witnesses which took only temperature into account.

MR. MCCABE: "Q. Mr. Carter, in making the calculations that you did for defendants' exhibits 1165 and

1164, you used in certain instances, what we call the die off or disappearance rate.

Now if the die off and disappearance rate which you used is taken from data such as you have calculated here, this will include not only the death of the organisms, as you indicated, but whatever else, with the exception of dilution, is happening to them, for whatever reason. In other words if they are settling out, if zooplankton or whatever else eats bacteria, is eating it in the lake, if there is a problem with chemicals in the lake, this type of coefficient will take that into account, will it not?

A. That's correct.

Q. If on the other hand you take a die off coefficient which merely reflects death in the laymen sense, and ignores sedimentation, either coming through the harbor or down the river or out into the break water, ignoring what is happening to the bacteria in the lake, for whatever reason *you are not going to get a result at the state line reflective of what is happening in reality in the lake, are you*?

A. *I don't believe so.*" (emphasis added) (Tr. pp. 8991-8993)

The fact that all of the adverse factors present in the lake with respect to pathogens must be considered is also testified to by defendants' witness Dr. Pritchard.

"By Mr. Karaganis: Q. Do you consider in-situ experiments where there is lake water in a bottle placed in the lake?

A. I don't consider that to be an in-situ experiment, no, because all of the factors involved, in-place grazing, sedimentation, do not enter into that kind of experiment.

What I am talking about is where one has followed the die off of bacteria in the body of water where all these processes can take place. That is what I call the in-situ measurements.

Q. When you say die off——

A. When I say die off, I mean in general, whatever happens, disappearance.

Q. Disappearance? In other words, they are not dead they are somewhere in the water column?

A. No. They may be in the belly of a zooplankton, or they may be on the bottom." (Tr. p. 7173)

The evidence shows without contradiction that in addition to dilution and thermal effects there are four additional factors present which will adversely impact against any viruses which may be discharged in the Milwaukee vicinity. They are: sedimentation, biological inactivation, ultraviolet radiation, and predation.

The potential for viruses to either settle out themselves or to adsorb on other particles which settle out was testified to by plaintiffs' witness Dr. Melnick:

"Q. Does adsorption occur in natural water, such as in Lake Michigan?

A. Well, the virus is adsorbed to solids that exist in the water.

Q. So if you have solids in the water, some virus particles at least would attach?

A. Yes.

Q. What happens to them when they attach to those solid particles?

A. They move with the solids. If the solids are settled out, one will find viruses on the solids. This is

why the virus is found in sludge, for example." (Tr. p. 2260)

Defendants' witness Dr. Sproul testified to the ability of viruses to adsorb to particles in water in the natural environment.

"A. This paper dealt with the adsorption of viruses to clay particles under conditions that would be experienced primarily in the natural environment, and we demonstrated for the first time that viruses under environmental water conditions have the ability to adsorb to relatively high extents on clay particles. These clay were those that were obtained from natural deposits as well as from naturally occurring clays which I previously had isolated from the Missouri River." (Tr. p. 10387)

Defendants' witness Dr. Cliver explained that the sedimentation process continues after effluent leaves the sewage treatment plant:

"Q. If the viral particle were adsorbed to a particle that were susceptible to sedimentation, would that mean that the viral particle would sediment with it?

A. Oh, yes, materials do settle out all along the way, to be sure.

Q. So in any event, the viral particle that had come through the treatment plant adsorbed to some particle, if that particle had settled to the bottom in transit, then the viral particle would settle to the bottom?

A. That is correct." (Cliver, Tr. pp. 10245)

The witness Pritchard introduces a series of ways in which pathogens disappear rather than being transported.

"Simply based on the fact that we can list the processes by which any living organism that drifts with

the water or moves with the water can disappear, and this is just general understanding of the basic physics and chemistry and biology, which I have training in, one process by which concentrations can change is by diffusion. We have talked extensively about that.

But a living organism can disappear as a living organism by dying. It can disappear as a living organism by dying. It can disappear as a living organism by being eaten, which is also death but we call that grazing.

So there is mortality, grazing, and then the living organism is a particle. It usually is attached to other particles which have a density greater than water. So the particles are settling out and the organism is settling out.

So there are, in addition to dilution, which I do not believe happens in the harbor, there are the processes of mortality, grazing, and sedimentation." (Pritchard, Tr. pp. 7014-7015)

Carter sees those factors which cause disappearance of living organisms as being distinct from those operating on conservative or non-living substances.

"Q. The basic question is on what you make your determination that the coliforms will be at their greatest concentration in terms of the patch released at the same time or at the same point that the dye is at its greatest concentration.

A. I am not sure I understand the question, but I think I can explain and get what you are trying to ask.

The concentration of dye and the concentration of coliforms are reduced by several processes. Both of them are subject to dilution by diffusion.

In addition, the coliforms are subject to additional factors which cause their disappearance, let's say.

Sometimes they settle out—sedimentation.

Sometimes they are eaten by another organism.

Sometimes there are not enough nutrients in the water to support them.

But over and above any decrease in concentration due to dilution, there is an additional disappearance which is termed the die-away rate or disappearance rate." (Carter, Tr. pp. 8586-8587)

Predation is shown to be a significant and widespread process in Lake Michigan.

"Q. Are many of the zooplankton able to eat bacteria in a manner similar to the benthos?

A. Any aquatic animal that eats particulate matter is going to ingest a substantial amount of bacteria in association with that particulate matter." (Otto, Tr. p. 10086)

Carter and Zanoni did a dye study at the South Shore Treatment Plant (Def. Ex. 86, App. C; Def. Ex. 282). The test showed that 90% of the fecal coliform in the treated sewage being discharged by that plant disappear within 8 hours and that virtually all such coliforms disappear within less than one day. This test is the only such test in evidence.

The rivers and the Milwaukee harbor which receive effluent discharges act as settling basins in which substantial decreases in solids, and therefore viruses and bacteria, occur.

"Q. You described the rivers or portions of the river as sediment basins.

What do you mean by a river being a sediment basin?

THE COURT: Did you sediment basin or settling basin?

THE WITNESS: Settling.

THE COURT: Settling, that is what I thought you said.

THE WITNESS: I may have said sediment. I mean settling.

The Milwaukee River is a classic example. You have flow coming over the North Avenue Dam. It has a certain solids content. The type, size and amount of solids in that water is dependent upon the velocity of that water.

Once the river passes over the dam and hits that portion of the river which is influenced by the lake, the velocity slows down considerably, and once you change that velocity, you are going to change the characteristics of the material which is being held in suspension.

The heavier particles, which need more energy to stay in suspension, will settle out. That is what I was getting at.

BY MR. MCCABE:

Q. Is that true during wet weather flows and dry weather?

A. It would be true during any type of flow condition. Any time you change your velocity of your river, you are going to change what is being held in suspension, even the lake. For instance, that is one reason why sandbars develop. You are changing something, the energy distribution of water past a point, and you are either going to get scour or you are going to get deposition.

Q. So that to the extent that the overflow from either the combined or the separate sewer enters the river, it is entering, in a sense, a settling basin?

A. Yes, that would be a good analogy." (Gruber, Tr. pp. 5174-5176).

A process of "purification" is constantly taking place in the water in the Milwaukee harbor.

"Q. On the basis of information in this little survey which you conducted of all the Health Department information, do you have any conclusion as to what takes place with the water that comes out of the river mouth and into the harbor area? What takes place out in here (indicating) after the water leaves the river mouth?

A. There is a variety of things that happen out there, which in the classical sense you would describe as purification capacity——

Q. Now, when you say—go ahead.

A. —or capability. One of the things you have to look at that area as is as a sedimentation basin that carries on a function comparable to the basins in the treatment plant.

Q. When you say a function similar to that in a treatment plant, can you describe that in a little more detail, what you mean by that?

A. In a sedimentation basin in the treatment plant, primary sedimentations are designed usually to control flow to drop solids, and the limit on flow is usually accepted as one foot per minute.

So that when the river discharges here are reasonable and the water flows in there and distributes itself within the harbor, the velocities undoubtedly get below

one foot per minute. Under those conditions then, you will get a significant dropping of the suspended matter in that area.

Q. In a sedimentation basin in a sewage treatment plant, what is the rate of flow?

A. One foot per minute.

MR. KARAGANIS: Excuse me, Mr. Moerke. I may be misinterpreting Dr. Sawyer's testimony.

Is it one foot per minute or one foot per second?

THE WITNESS: No, the grit chamber is one foot per second. One foot per minute in a primary sedimentation tank such as you have at the Southwest Plant.

BY MR. MOERKE:

Q. Do you believe that the natural purification in the harbor, to which you have just testified, results in the lower levels of coliform at the various harbor entrances? Is that the reason for why you get less counts at these other places?

A. Yes, there are undoubtedly a number of factors that are a summation of a lot of things that bring about the reduction in coliform organisms, sedimentation only being one of the items." (Sawyer, Tr. 7290-7292).

* * *

"Q. Based on the information in this chart, what conclusions can you draw from the plotting of the information on this chart, Dr. Sawyer?

* * *

A. The title of this is "Purification Adaptability of the Harbor Waters," and I think it demonstrates very effectively the ability of the water within the harbor to mitigate the coliform counts in the water leaving

the harbor through the main harbor entrance." (Sawyer, Tr. p. 7304).

Defendants' witness Dr. Cliver testified that he had, as a result of his experiments, determined that there was biological inactivation of viruses occurring in lake water.

"Q. What was the purpose, again, for doing this study?

A. We were interested in the rate at which virus was inactivated in lake water, and further were interested in the possible participation of micro-organisms that would occur spontaneously in lake water in the inactivation process.

* * *

Q. What conclusions were drawn as a result of this study?

A. Well clearly there is a range of stability of these viruses. They aren't all exactly alike in that regard. So one can't give a single value for die off rate for viruses at a given temperature.

Beyond that, it appeared that the living system that was involved here, the organisms in the lake, did participate in some way in the inactivation because if we removed them beforehand and then put the viruses in, inactivation was slower at the same temperatures." (Tr. pp. 10226-10229)

Dr. Melnick also testified that in order to determine a die off rate a number of factors about the biological makeup of the water environment would have to be known.

"Q. In order to determine a die off rate, so to speak, in Lake Michigan, wouldn't you have to know what types of bacteria were present, what types of viruses they would be giving off, what type of enzymes they

would be giving off, that is and how these enzymes would be reacting with heat if they did on viruses?

A. If that is what one wanted to study yes. I don't think that any useful information would come out of such a study." (Tr. pp. 2298-2299)

* * *

Q. Are there any types of biological inactivation one would expect in fresh water?

A. Not that would compete, let's say with heat. Heat would be much more effective a deactivator than, let's say, any enzymes that might be produced by bacteria which might be deleterious.

Q. Then you would expect in fact some enzymes from bacteria——

A. There may be. I said I don't know of any. If there are any, the amount of deactivation caused let's say by bacterial enzymes would be much less than would be caused by the heat the viruses would be subjected to.

Q. But they could be cumulative? In other words, in determining a die off rate for viruses, you would have to add the heat, ultraviolet and the biological?

A. There may be more than one factor. That's right." (Tr. pp. 2297-2298)

It should be emphasized here that although plaintiff's witness testified that in order to determine a die off rate, all of these factors would have to be known, the plaintiffs *never*, in fact, determined a die off rate in Lake Michigan which encompassed these factors, but only developed testimony centering on thermal inactivation and dilution.

The third type of inactivation which would occur in natural waters is ultraviolet radiation. Although the evi-

dence indicates that ultraviolet inactivation is not very significant because it occurs only near the water surface, such inactivation is a factor adverse to viruses which should have been considered. For example, Dr. Melnick testified:

"DR. MELNICK:

A. Radiation will also inactivate viruses.

Q. What type of radiation?

A. Ultraviolet radiation, for example. For that you have to have the virus present and exposed to a fairly large dose. That means you have to have a very thin layer of fluid in order to achieve inactivation by ultraviolet radiation.

Q. Ultraviolet light comes from the sun?

A. Yes.

Q. How thin of fluid would be required for inactivation?

A. A fraction of an inch." (Tr. p. 2292)

The final factor which will cause inactivation of or removal of viruses from the water volumn is predation. Like sedimentation, predation begins with adsorption to solids. Although sedimentation can occur with respect to either biologic or nonbiologic solids, predation occurs primarily with biologic solids which are edible. The witnesses have indicated that viruses will be adsorbed to or tied up with biological material in the water when they are introduced into the environment. Dr. Cliver's testimony addresses this point.

"Q. Once a virus were to get into water—now we are talking about an enterovirus for simplicity's sake—is it able to move under its own volition within the water media?

A. No, it may not even be free as a particle so that option would exist. The virus that occurs in feces and is

shed into sewage or other waste into the environment is produced by the cells that line the intestinal track [sic], and these cells are sloughed off at a great rate every day. So that very frequently the virus seems still to be associated with cells or fragments of cells in the feces.

In one way or another, these are to a considerable degree associated with solids and tend to diffuse in water in association with those. Otherwise, they diffuse free, but they have no mobility of their own that could govern their travel." (Tr. pp. 10188-10189)

Defendants' witness Dr. Sproul also indicated that the viruses discharged from a treatment plant would be adsorbed to the surface of biological material.

"Q. All right. What kind of solids are discharged by sewage treatment plants over the clarifiers?

A. Biological solids which are the principal solids that are discharged in this case have a light flocculant fluffy nature, in which there are a lot of pore openings into the bio-mass. That is the way these things exist.

Viruses were adsorbed unto the surfaces." (Tr. p. 10657)

The organic material containing the viruses or having the viruses adsorbed to them are consumed by the various natural predators within the lake, which begin their food chain with organic material found within the water column and at the bottom of the lake. Defendants' witness Dr. Otto testified as to the nature of the food chain within the lake.

"Q. With respect to the biota, would you give a general indication of how various levels react with one another in the lake?

A. They are principally interrelated from the standpoint that one eats another. Phytoplankton serve as a

food base for the herbivorus zooplankton and to a lesser extent for some of the macro-benthic organisms.

Periphyton, decaying organic matter on the bottom, serve as the major food base for the macro-benthic organisms.

* * *

In general, zooplankton eat phytoplankton and macro-benthics eat just about anything they can get their hands on, that is, on the bottom, and fish eat zooplankton and macro-benthos.

* * *

Some kinds seek out food or seem to seek out food in the sense that they have a specific food preference, which is expressed before they take a bite. Some kinds of amphipods would be examples of that.

Others such as the aquatic worms, seem to just move through the substrates ingesting the substrate material itself and digesting out what is available of an organic nature in that material and rejecting the remainder as feces. (Tr. pp. 10081-10083)

* * *

Q. Can you describe what zooplankton are a little more?

A. Yes, they are small crustaceans. They are free swimming in the water column. They have a hard outer shell as a skeleton rather than an internal skeleton.

* * *

Q. What is the food source of zooplankton?

A. . . . They will eat particulate matter if that happens to come along.

Q. Are there any of the zooplankton able to eat bacteria in a manner similar to the benthos?

A. Any aquatic animal that eats particulate matter is going to ingest a substantial amount of bacteria in

association with that particulate matter." (Tr. pp. 10085-10086)

Defendants' exhibit 1321 indicates the abundance of the many predator grazing organisms in the lake. Some grazing organisms can be as numerous as 10,000 per square meter in various areas of the lake between Milwaukee and Illinois. Since several types of such organisms may coexist in the same area literally tens of thousands of predators may be present in any one square meter.

Plaintiffs' case is totally devoid of any opinion by any witness that pathogens, either bacteria or viruses, will survive a movement in a body of water from Milwaukee to the Illinois state line. This is easily demonstrated by a point-by-point review of the transcript and record citations used by Illinois in its supplemental memorandum between pages 56-66, in which Illinois attempts to demonstrate the transport of those pathogens.

Beginning at page 56 through the top of page 58, testimony of plaintiffs' witness Verber is used. This, however, is limited strictly to the transport of water. No reference is made to any pollutant of a nonconservative nature. The second quotation in the middle of page 58, taken from plaintiff's exhibit 20 authored by plaintiff's witness Csanady, has already received some discussion on pages 22-23 of this memorandum. Plaintiffs' exhibit 20 used the word pollutant in its conservative sense. Dr. Csanady even defined a dye as a pollutant. Nowhere is there any attempt in plaintiffs' exhibit 20 to discuss the transport of a nonconservative pollutant such as a pathogen. Csanady's testimony as opposed to his writings are quoted beginning the bottom of page 58 through the top of page 60 of Illinois' supplemental memorandum. The bulk of the quotation concerns the transport of water alone. The context of the portions in which he refers to pollutants, without defining whether he is discussing a conservative or nonconservative

pollutant, reflects that he is using the term interchangeably with the transport of water.

Dr. Csanady, a witness upon whom Illinois places principal reliance, in fact has not worked on or done studies on Lake Michigan.

Csanady gave advice concerning an Argonne National Laboratory study (Tr. p. 1934). He did author a portion of plaintiff's exhibit 20 relating to Lake Michigan. However, it is specifically stated therein that the discussion is a general one which is applicable to all the Great Lakes. All data cited in the report is credited to other authors' work or to work Csanady did on other lakes.

At Tr. p. 1938, Csanady says he had "some contact with" work which was carried on at the University of Wisconsin in 1966 and 1969 both in Lake Michigan and Lake Superior.

At Tr. 2671-2675, Csanady states that he based his estimate concerning the frequency of transport from Milwaukee to Illinois primarily upon the work of Sato & Mortimer (Pl. Ex. 38).

On pages 15 and 16 of its original brief on appeal, and at page 58 of its supplemental memorandum, Illinois quotes from pages 115 and 116 of plaintiffs' exhibit 20 attributing the quote to Csanady. The first part of that quote is missing. The missing part reads: "In the section of this report dealing with lake currents, Dr. Mortimer points out that . . ." Csanady is actually quoting Mortimer!

In its supplemental memorandum, Illinois does not address the fact that a pollutant plume, much less nonconservative pollutants such as pathogens, would not reach points near shore in Illinois so as to present a hazard. The record reflects that it would not do so. The exchange on Tr. pp. 2583-2585 is as follows:

"Q. Fine. All right.

Directing your attention to Plaintiffs' Exhibit 134-A, this overlay map, with respect to these plumes that are drawn in here at various distances along the shoreline, in a typical situation how far off of shore would the western edge of these plumes be?

A. The western edge?

Q. Yes. The edge closest to the shoreline.

A. Well, it is difficult to define an edge there, but we were saying that as the plume travels along the shore, it is carried down by the faster currents, initially at any rate, the center of which is further from shore, several kilometers from shore. So that this leaves a band of smaller concentration on the in-shore side, of perhaps half a mile width.

It depends on the exact topography and current.

Q. You are saying the plume, the center part, the most concentrated part of this plume, could in fact get out into currents that are two or three miles offshore, is that right?

A. Yes. It will somewhere.

Q. So this pictorial perhaps is a little misleading in that it shows it right hugging the coastline, isn't it?

A. Well, it is in that sense, but, you see, it is very difficult to define the boundaries of the plume. The concentration simply decreases from the center as you go shoreward, and there is a certain decrease. The maximum occurs a certain distance from shore. But it doesn't decrease to zero. So that artist is perhaps justified to fill it in between the center of the plume and the shore zone as an area which is at least likely to be exposed to the influence of this plume.

Q. But you stated, did you not, that the portion of the plume we are most concerned with is the one of

maximum concentration? With respect to Illinois and getting stuff into Illinois, we are most concerned about the major concentration within the plume.

A. Certainly. For the reason, Mr. Moake, that it is sometimes washed up on the beach. It is two miles at this location, and then there is, say, a projection into the lake, and there you find this center line of the plume getting much closer to the shore and really fumigating.

Q. And it is right that the centermost concentrated part of the plume can get out two or three miles in fact within this near-shore zone offshore, isn't that correct?

A. Well, I would expect that this would be the normal situation, that the most concentrated part would be several miles." (Csanady, Tr. pp. 2583-2585).

Note that Csanady first locates the plume: "the center of which is further from shore, several kilometers from shore." Then Csanady describes the band of "smaller concentration" as being "of perhaps half a mile width" on the in-shore side. As a half mile is less than a kilometer, Csanady thus has the *entire* plume several kilometers from shore. He then reiterates that the center could get into currents that are "two or three miles off shore." Then Csanady discusses an artists perception of the plume saying that the concentration decreases as you go shoreward and "the maximum occurs a certain distance from shore." Csanady then hypothesies that there is, "say, a projection into the lake, and there you find this center line at the plume getting much closer to the shore." Csanady, of course, does not point out any such projection! Immediately after such hypothetical speculation, Csanady is returned to admitting "that this would be the normal situation, that the most concentrated part would be several miles [offshore]." When his assessment of the plume as extending a half mile toward shore is considered against the location of the plume two or three

miles is considered against the location of the plume two or three miles offshore, the plume and all ports of it are seen to be at a sufficient distance from shore as to present no hazard to Illinois, no matter what is in the plume!

But Csanady goes further. In accordance with the explanation found in the City of Milwaukee's original brief at pages 15 to 20 he specifically testifies that changes in currents result in "cleaning out the coastal zones."

> "Q. Is there any difference in your opinion between the effects of current reversal and the effects of upwelling and downwelling on diffusion of materials in the lake?
>
> A. No, that is the same phenomenon that we are talking about. The change from upwelling to downwelling that accompanies the current reversal, and that is the approximately physical cause of cleaning out coastal zones.
>
> As an upwelling changes into a downwelling or vice versa, there is this large mass exchange and that of course, is the direct cause of the removal of pollutants." (Tr. pp. 2704-2705)

Csanady had covered this point before.

> "A. At the time that the thermocline moves rapidly up, which is associated with the reversal of the current as we mentioned this previously, on a reversal of current direction there is a complete clean-out of the coastal zone. Whatever effluent that we had there mixes with the rest of the lake and that mechanism there basically underlies this process because, as the current reverses, the direction of the thermocline slope also goes from downtilt to uptilt or vice versa, and a massive exchange of water takes place between the coastal zone and the middle portion of the lake.

So this is what keeps the coastal zones in effect clean." (Tr. p. 2076)

* * *

"Court: What would happen if the slug reversed, say, after three days, and went back up north? And the current reverses again? What happens?

Witness: As the current reverses, Your Honor, that is coupled with the kind of on-shore/off-shore motion that completely cleans out the coastal zone. So when the current moves in one direction, as the wind starts blowing from the opposite direction, that moves the top water. So it cleans out the coastal zone.

Court: Where does it move it?

Witness: It mixes it up with the rest of the lake, the deep parts of the lake. We have never been able to find any trace of these things. We have done coastal-zone studies with dye, and after a current reversal, generally speaking it is not possible to find what happened to the dye." (Csanady, Tr. p. 2031).

In the light of the overall testimony of Csanady, one fact is clear. The pollutants, either conservative or non-conservative, which may have entered Lake Michigan at Milwaukee never get close enough to shore in Illinois to cause any hazard.

The portion of Csanady's testimony from page 2063 quoted at page 60 of the Illinois supplemental memorandum, which speaks of fecal coliforms, can be seen from a review of the surrounding transcript to be limited to considering dilution and the factor of thermal inactivation; however, Csanady himself recognizes, as indicated in the portion of this memorandum on conservative vs. nonconservative pollutants, that fecal coliforms do undergo degradation by such things as predation and sedimentation.

Next, Illinois quotes from Dr. Pritchard without indicating that Dr. Pritchard was very clear to point out during the testimony both before and after the indicated citation at transcript page 7175 that he was dealing with conservative pollutants (see pp. 20-22 *supra*).

The last portion quoted on page 60 is testimony of defendants' witness Harry Carter. The testimony refers to the movement of currents. It has no relationship whatsoever to a discussion of nonconservative pollutants and Carter himself is clear to point out at other portions of the transcript that in order to effectively judge whether a nonconservative pollutant can travel from Milwaukee to Chicago all of the factors have to be considered (see pp. 28-29 *supra*).

With respect to survival of pathogens, which Illinois conveniently divorces from the issue of transport, two witnesses are cited: Mr. Geldreich on bacteria and Dr. Melnick on viruses. The testimony on bacteria will not be reviewed separately from that on viruses as both are subject to the same factors of elimination and viruses, if anything, are more sturdy and longer-lived. The trial court has found that the bacteria count (fecal coliform on Illinois beaches) shows that there are insufficient bacteria in Illinois to indicate transport of pollutants from Milwaukee. (A.Ap. p. 35) We also note that Illinois' bacterial discharge standards are identical to those of Wisconsin, and Illinois should not be heard to demand a more stringent standard of municipalities 25 miles away in a neighboring state than it demands of its own municipalities. Of interest on this point is the position of EPA which permits a much more lenient fecal coliform count *on bathing beaches* than the 40 per 100 ml standard required by the trial ocurt to be observed 25 miles away from Illinois.

> "Q. Is it fair to state that with respect to the bathing beach standards, presently EPA is rethinking its

standards and that this is something of a continuing process?

A. We are always rethinking all standards. We are always trying to get a finer, more definitive answer to all of our standards.

At the present time, let me assure you that our standards are 200 fecal coliform per 100 ml, and there is a new publication—you haven't had the opportunity to review it—but a new one which I have seen a press copy of internally that will definitely say again 200 fecal coliforms per 100 ml is what we recommend." (Geldreich, Tr. p. 3161)

With respect to the issue of virus survival, Dr. Melnick is quoted. But, as in the past, the only adverse factor with respect to viruses which is discussed is thermal inactivation. As indicated above, Dr. Melnick himself is of the opinion that all of the other factors must be included in any discussion of die off. To justify a finding by the court that there are pathogens in Illinois waters, Illinois from page 62 through 64 quotes discussions of the transport of water by Dr. Csanady and Dr. Pritchard. These are discussions of the number of times that water would be transported from Milwaukee to Illinois. It confuses the issue of the transport of conservative vs. nonconservative pollutants. No discussion whatsoever of pathogens per se is found in these two citations.

Lastly, at page 64 through the top of page 66, there is a discussion of the fact that viruses settle to the bottom and that they might be resuspended at a later time. With respect to this, we note the following:

1. There is no testimony by anyone as to the conditions under which resuspension might occur;

2. There is no testimony by anyone that even if viruses are suspended they would in fact reach Illinois in an active state; and

3. Inasmuch as the currents are going to flow into the middle of the lake when there is a change in a southward current, any viruses not moved directly into the middle of the lake on the interruption of the southward flow would in all probability move after resuspension into the middle of the lake with subsequent current changes (see City's original brief pp. 15-20 and this memorandum pp. 43-44).

The only proof by plaintiff directed to the question of transport of *pathogens* (as opposed to conservative pollutants) was the dilution testimony of plaintiffs' witnesses who only took into account the factor of temperature as it may adversely affect pathogens. Thus, they *did not* take into account factors such as sedimentation, predation, chemical effects in the water or ultraviolet radiation. The record contains neither direct evidence of the transport of *pathogens,* nor any opinion by any expert witnesses of such transport. The lower court was therefore totally without evidence upon which to base a finding that pathogens, in fact, do survive the alleged journey from Milwaukee to Illinois.

B. Available Tests Were Not Performed.

1. *Viruses That Exist In A Body Of Water Can Be Found By Available Tests.*

"Q. Dr. Melnick, what specific testing for viruses have you ever done in Lake Michigan?

A. In 1943, during the polio epidemic, I spent a summer here studying that epidemic and testing for viruses in the Chicago River water and in Lake Michigan.

Q. What were the results as far as Lake Michigan were concerned?

A. We did not find any in Lake Michigan by the tests that we used at the time, but we found——

Q. Do you know whether or not Lake Michigan has been tested for viruses since that test?

A. No, I don't.

Q. Do you have any knowledge of any other tests that have been made with respect to viruses in any part of Lake Michigan.

A. No.

* * *

Q. In Lake Michigan, how many gallons of water would you need to reduce in order to get a sample that you feel would indicate the virus count?

A. It depends on where the sample is taken. For example, if one is testing raw sewage, it isn't necessary to use the Aquella machine at all. One can just take the raw sewage itself and test it without concentration.

If one is looking for virus in water that has been treated or even untreated but where the virus concentration is apt to be low, then one has to use larger volumes of water.

Q. If you were testing the water out in Lake Michigan, outside of the breakwater, let's say, or off of Chicago several hundred feet, how many gallons of water do you think you would need to run through the machine in order to get a sample that you could use.

A. I am not sure where the breakwater is that you mentioned in relation to——

Q. All right, let's put it more simply than that. Suppose you were going to take a sample of Lake Michigan water and test it for viruses and that you wanted to test that water that is 5 miles offshore.

Do you have any idea, could you tell the Court how many gallons or liters of water you would have to use?

A. I would say at least 100 gallons.

Q. What would depend on, how many gallons you would use?

A. It would depend on the virus concentration which is apt to be present.

Q. Did you ever do any testing with the Aquella machine in Lake Michigan?

A. No.

* * *

Q. You have no evidence which would prove the existence of any particular quantity of viruses on any day, do you?

A. I have not done any testing in Lake Michigan.

Q. You don't know whether there are any viruses in Lake Michigan, do you?

A. If what you tell me is true, that the sewage from Milwaukee is discharged into Lake Michigan, then I know there are viruses in Lake Michigan.

Q. Do you know that there are any viruses in Lake Michigan five miles from shore in Lake Michigan, off of Milwaukee?

A. No, I do not.

Q. Do you know whether there are any viruses in Lake Michigan five miles offshore at Racine?

A. No.

Q. Or Kenosha?

A. No.

Q. Or Chicago?

A. I have not tested any of these places.

Q. Do you know whether or not viruses have been detected in the raw water intake of any of the Illinois water intake?

A. No, I do not.

Q. Do you know whether viruses have been detected in the finished water from any of the water plants in the State of Illinois?

A. No, I do not." (Melnick, Tr. 2240-2248).

Viruses can be tested for and found.

"Q. Did you find any viruses in the Houston ship channel?

A. We sure did.

Q. How far down from the Houston ship channel is the—what bay does it run into? Is it Galveston?

A. Yes.

Q. Did you find any viruses in the bay, or did you test for any?

A. We didn't find any in the bay. But, as I recall, we found some about 10 miles or so from the source." (Melnick, Tr. p. 2301).

Wellings confirms that viruses can be tested for and found.

"Q. Have you actually tested the water of Tampa Bay for viruses?

A. Yes.

Q. How many times have you done that?

A. We have only tested those about—I think we did 3 gallons in toto because we are not funded for this, but once in a while I get curious about something and I say "Let's get it."

Q. Did you find any virus?

A. Yes, we did.

Q. How about the Gulf of Mexico?

A. Never tested the Gulf." (Wellings, Tr. p. 13350).

2. *Tests Could Have Been Performed To Show The Actual Relationship, If Any, Between Water-Borne Viruses And Viral Infection: None Were Used by Illinois Which, Instead, Relied Upon Speculations From The Discharge And Transport Theories.*

"Q. As a virologist, you from time to time have to set up studies, do you not, as to how to go about testing certain things?

A. Yes.

Q. As a virologist, what type of a test would you devise in order to test whether or not the use of recreational waters at a location of, say, Zion, Illinois had any direct relationship to the incidence of viral disease in the Zion population, Zion community?

A. You said in relation to disease as such?

Q. That is right.

MR. KARAGANIS: Excuse me, your Honor. I don't think Dr. Cliver has been qualified as an epidemiologist in terms of disease. They had a witness on who testified about that.

MR. MOAKE: I misspoke. I did not mean disease. I meant incidence of infection.

MR. KARAGANIS: Same thing.

THE COURT: Ask him if he participates in such studies.

BY MR. MOAKE:

Q. Have you ever participated in studies where you were trying to relate viral infections to water, for example?

A. There is a study very like what you are describing that is underway in Madison, and although I am not a participant of record, I was certainly asked to participate in the design of it.

Q. In your profession, do you attempt to devise tests in order to determine whether or not a virus in a given medium can cause infection?

A. Yes, and we also have occasion to try to determine directly whether or not the infection has occurred.

Q. If you were asked to determine whether or not a virus existing in a body of recreational water was in any way related to the incidence of infection in the community that used that recreational water, how would you devise that test?

MR. KARAGANIS: Excuse me, your Honor.

THE COURT: Overruled. He has plenty of expertise. He can give it from his standpoint.

There is no law that says you have to wear a particular badge——

MR. KARAGANIS: I understand that, but in none of the qualifications has there been any evidence that he has attempted to relate viral concentrations to human infection.

THE COURT: Even if he hasn't, I think his qualifications are good enough for him to express an opinion on it.

Go ahead.

By the Witness:

A. My choice would be to try to get volunteers who customarily swam in that body of water and the way that these studies are designed is to do a work-up on each volunteer, first to determine whether he or she is presently infected, but also to get what one might call demographic data on them, age, sex, area of the community in which they live, et cetera.

Then one attempts to find a matched individual who shares as many of those properties as possible but does not swim or doesn't swim habitually in the water in question.

If then the sets of matched individuals were willing to allow or to submit fecal specimens on some periodic basis, one could by quite standard virologic procedures test these to determine whether there was any significant difference in the incidence of intestinal infection with viruses in the group that swam as opposed to the group that didn't swim.

The Court: The old identical twin test.

Mr. Karaganis: Your Honor, the Court can take judicial notice. There are certain people who live up in the Waukegan-Zion area. Are there are volunteers?

By Mr. Moake:

Q. That sort of a test would not place the person who was swimming at any greater risk of infection than they would otherwise have by undertaking their normal daily routine, would it?

A. No, it was a given that these are people who habitually swim, and we assume that they habitually defecate, and so there is no real effort on their part other than saving the evidence for laboratory analysis." (Cliver, Tr. pp. 10246-10250).

C. Activated Sludge Plants Such As Those In Milwaukee Both Remove And Inactivate Viruses And Bacteria.

It is uncontradicted that the secondary portion of activated sludge treatment plants like those in Milwaukee both inactivate and remove viruses and bacteria. Plaintiff's witness Dr. Gerald Berg testified:

"Q. I wonder, Doctor, if you would read the portion of that report which I have outlined in pencil into the record, please?

(There was a brief interruption, after which the following proceedings were had herein:)

MR. KARAGANIS: You have to read it aloud, Doctor.

MR. MCCABE: I meant to read it aloud.

THE WITNESS: Oh, you want me to read it aloud?

MR. KARAGANIS: For the record, perhaps with the Doctor's voice, I wonder if we might just give that or I will read it into the record in lieu of the Doctor. It is a long paragraph, your Honor.

MR. MCCABE: How about if I read it?

THE COURT: All right, let Mr. McCabe read it.

MR. KARAGANIS: Mr. McCabe will read it.

MR. MCCABE: "Laboratory studies on the efficacy of a continuous flow bench model activated sludge unit have recently been reported. Raw sludge and virus were fed separately to this unit at rates which allowed 6 to 7 hour retention time, and the unit was seeded with 200 to 400 parts per million of activated sludge (expressed as volitile [sic] solids). Except with the 200 parts per million seed, the unit consistently removed about 98 percent of the Coxsackie 9, Coxsackie 89 virus and 90 percent of the poliovirus, type I. Coliform and fecal streptacocci [sic] removal were about 97 and 96 percent respectively.

'A control experiment, in which the unit was fed only virus and sewage in the absence of any activated sludge, showed that about 60 percent of the virus was removed. This latter observation would appear to indicate that suspended solids, colloidal material, and also perhaps toxic substances play a role in the reduction of virus as raw sewage is treated by activated sludge.

'The activated sludge undoubtedly removed most of the sewage-virus complex in addition to most of the remaining 'free' virus. Kelly, et al have recently reported on the removal of poliovirus in bacterial phage [sic] from sewage by activated sludge. Their data show that the removal of virus consist of at least two steps: 1, aeration in the presence of sludge floc and nutrients and 2, settling of floc. Their study and others give no information on the actual fate of virus removed, although Kelly's data suggest that viruses may be inactivated by biological antagonists in the sludge complex. This suggestion is supported by the isolation from sludge of at least four strains of bacteria with anti-viral activity.'

I am sorry, 200. When I said 200 to 400 per million of activated sludge, it was 200-4000." (Berg, Tr. pp. 12203-12206)

Plaintiff's witness Dr. Melnick testified:

"THE COURT: Does any part of the sewage treatment process other than chlorination remove or kill viruses?

THE WITNESS: Yes, sir, each procedure that is used in sewage disposal will usually inactivate a certain fraction of viruses present.

THE COURT: Do they participate in the activated sludge process?

THE WITNESS: Yes, activated sludge will usually reduce about 50 percent the virus that is present in

sewage, but if you start with something that is up in the area of thousands, you are still left with thousands when you finish.

THE COURT: Are viruses one of the eating organisms or one of the organisms that is eaten?

THE WITNESS: Is eaten. (Melnick, Tr. pp. 2208-2209)

* * *

Q. With respect to the activated sludge process itself, as you indicated may be 50 percent might be removed.

A. Yes, that is a fair figure.

Q. That is removal and not necessarily a kill, is it not? Isn't it a physical removal?

A. It could be a kill. It could be a die-off during the procedure . . ." (Melnick, Tr. p. 2212)

Defendants' witness Sproul also testified that the activated sludge process biologically inactivates viruses, in addition to physical removal thereof.

"Q. Are any viruses removed in the secondary phase of an activated sludge plant?

A. Yes, there are several mechanisms that take place whereby viruses are removed in a secondary treatment process. Specifically I am thinking now about the activated sludge process.

When viruses enter such a process, within a short period of time they are adsorbed to or are incorporated within the biological solids that are in the aeration tanks. One of the removal processes then is this: that when the activated sludge mass in the water is conveyed into a secondary clarifier, that biological mass settles to the bottom of the tank and those viruses that are incorporated within that bio-mass will be removed.

At the same time there is a destruction of the viruses that are incorporated within that biological mass. The principal means by which that occurs is by biological oxidation. (Sproul, Tr. p. 10421)

* * *

Q. You indicated that the bacteria oxidized organic material, and they also will oxidize a protein coat. That is your assumption, not based on quantitative data, but on your logical process.

A. Evidence in the literature.

Q. Other than the Moore paper, what other evidence is there in the literature?

A. I will have to go through the computation I just described, if you want to see that.

Q. Not the computation, Doctor. Just cite who has done it in the literature specifically?

A. Kelly and Sanderson.

Q. Kelly and Sanderson?

A. Chuvall has done it. And Ebba Lund has done it. Every investigator who has worked in the area of virus and inactivated sludge has demonstrated this." (Sproul, Tr. p. 10582)

Q. Are you acquainted with Dr. Otis Sproul?

A. Yes.

Q. Are his opinions of a quality that are respected by people in the field of virology?

A. Yes, they are." (Berg, Tr. p. 12211)

As the above evidence shows, there is both biological inactivation and removal of viruses and bacteria in a sludge treatment plant like the ones operated by defendants. All of the witnesses on both sides who testified on

that point were in agreement that such inactivation and removal occurs. The trial court's refusal to accept this uncontradicted testimony (A-Ap. p. 36) was incorrectly based upon Wellings' analysis that *one* of the studies relied upon by Sproul (and plaintiff's witness Dr. Berg, as well) was, in her opinion, inconclusive. (Tr. pp. 13253-13257). However, Wellings did not testify that such inactivation does not occur, and the trial court was without any record basis for his finding on that point.

III. THE REMEDY REQUIRED BY THE COURT IS NEITHER NECESSARY NOR REASONABLE

A. Totally Disregarding Costs, The Lower Court Ordered A Remedy Which Is Not Cost Effective.

The lower court has required the defendants to collect, transport and treat all combined sewer volumes necessary to prevent any combined sewer overflow (CSO) discharges for storms creating runoff volume equal to the largest seen in recorded history in Milwaukee, without regard to cost of or the cost-effective character of such order. The only evidence as to the cost-effective level of collection, transportation, and treatment of combined sewer volumes is contained in the Stevens, Thompson and Runyan reports (Pl. Ex. 23-30). There is no foundation for requiring collection of a storm volume having a volume greater than that indicated as cost effective by Stevens, Thompson and Runyan.

In this regard, it is significant that defendants have reached an agreement with the Wisconsin Department of Natural Resources (the state permit-granting agency which acts in conjunction with the EPA under the federal statute and permit procedures) which agreement provides for handling and treating combined sewer overflows on a cost effective basis regardless of whether federal funds are made available. (Def. Ex. 1311).

Among other standards, the lower court ordered defendants to treat effluent from its sewage treatment plants to reach standards of 5 BOD, 5 SS and to produce a free chlorine residual. The following citations to the transcript indicate that these standards are not necessary or reasonable. Plaintiff's witness Melnick and defendants' witness Cliver recognize the desirability of seeking a cost effective solution.

"Q. You did state this morning, I believe, that the solids which might be in the effluent might protect the viruses from the effect of chlorination, is that right?

A. Yes.

Q. So if you had, let us say, less than 30 parts per million of suspended solids, [what] would be the kill of viruses in an activated sludge plant with secondary treatment?

A. It depends on the size of the solids. In general the cleaner the effluent, the more effective the chlorination.

Q. Would you consider 30 parts per million of suspended solids to be a clean effluent?

A. I think it is reasonable. (Melnick, Tr. p. 2257)

• • •

Q. I understand.

In determining whether or not one should put in a sewage treatment plant with facilities that would guarantee the 5/4 standard or the 10/12 standard—excuse me a 5 or 10 standard on suspended solids or a 30, you did indicate that there should be some balance between the additional amount of viruses removed in comparison with the money expended when making that decision?

MR. KARAGANIS: Excuse me, your Honor. The objection I would have is is he talking about a 30-day average or is he talking about a single day's value?

MR. MCCABE: You name it.

MR. KARAGANIS: Well, if you talking five and five——

MR. MCCABE: The question goes to the balance between cost and benefit, not whether it is a 30-day average or not.

THE COURT: Yes, overruled.

BY THE WITNESS:

A. I think in all public measures, there has to be a balance between cost and benefit." (Melnick, Tr. pp. 2343-2344)

Similarly, Cliver testified that cost-effectiveness was an important consideration when assessing the appropriateness of a particular discharge standard.

"Q. Dr. Cliver, is it your professional opinion then that rather than rely upon the effectiveness of water treatment plants from the standpoint of public health, it is desirable that viral discharges from sewage treatment plants be reduced as far as is possible?

A. Yes.

THE COURT: Why is that?

THE WITNESS: Perhaps I shouldn't have given that an unqualified yes in the first place.

One can presume to reduce to where there is none detectable in a million gallons, 10 million gallons, as opposed to one gallon or 100 gallons.

I think other things being equal, it is well not to inflict virus unnecessarily upon the environment under

any circumstances, but as we regard viruses as agents of disease, we have to remember that this is one, and not perhaps the major, mode by which viruses are transmitted.

It is my opinion that a community will best deploy its resources to prevent virus disease if the resources are apportioned proportionately to the risk involved. So that if we are striving for no virus in 10 million gallons, we are putting some resources into that that might better be expended on interdicting other modes of virus transmission instead.

So that is why I ought not to have given an unqualified yes. We go to a waste water plant and we take perhaps 5 liters of effluent, and we may not test the whole 5 liters, and we would prefer to find a negative test result; but as far as some of the astronomic quantities of water that other people have proposed to test, I really don't see the purpose of that. I regard it as counterproductive.

So in the context, I would rather not see quantities of virus discharged in the environment because there is always the chance of human error; but I don't think that we ought to go overboard on it." (Cliver, Tr. pp. 10344-10346)

This evidence is consistent with the views of the Illinois Environmental Protection Agency which has (as noted in our joint reply brief at pp. 18-19) proposed the deletion of the Illinois 4 BOD, 5 suspended solids effluent limitation based upon the extremely high capital and operating cost necessary to achieve compliance with such a severe standard.

Defendants' witness Sproul testified at length to the substantial removals and inactivations of bacteria and viruses which occur in the Milwaukee plants. Thus the remedy

ordered by the trial court without regard to funding or cost has been imposed for the purpose of removing—at a cost of hundreds of millions of dollars—only the final small percentage of bacteria and viruses from effluent being discharged 25 miles or more away from Illinois.

"Q. With respect to chlorination of a secondary effluent, assuming effluent quality in terms of suspended solids and BOD, what range of removal could be expected if the solids were in the range, let's say, of 20 to 50 or 60 parts per million?

A. Well, this will depend upon the amount of chlorine which is added to the wastewater. But, as it has been practiced over the last 18 months in Milwaukee, at the South Shore Plant, I would estimate that a minimum of 90 to 99 percent of the viruses that are exposed to that disinfection should be inactivated.

Q. Would that, for instance at the South Shore plant, be an additional 99 percent of the other increments of removal in the primary/secondary?

A. Yes. (Sproul, Tr. p. 10458)

* * *

Q. I am sorry, April.

Based upon this data which has just been identified, plus your previous professional experience, do you have an opinion as to the percentage level of removal of virus that can be expected from the Jones Island Waste Water Treatment Plant?

* * *

MR. MCCABE:

Q. The first question is do you have an opinion?

A. Yes, I do.

Q. What is that opinion?

A. Are we talking about the disinfection stage?

Q. The entire plant of Jones Island.

A. The '77, '76, and '75 operating information from Jones Island would indicate that in the activated sludge portion of the plant, the removal of viruses should be on the order of 90 percent.

Further to that, the precipitation and removal of phosphorus——

Q. By the activated sludge portion, what are you referring to?

A. The activated sludge process itself.

In addition, within that activated sludge tank there is a precipitation reaction going on for phosphorus, iron phosphate, and that, as I previously stated, this removal under the conditions there will be approximately 50 percent removal by the mixed liquor suspended solids.

The disinfection data for 1977-'76 shows average empirimetric [sic] chlorine residuals on the order of about 2 milligrams per liter, and the information available to me for 1976 indicates that the average monthly information indicates that there are traces of free chlorine residual at the end of the contact period.

* * *

By the Witness:

A. Considering the amount of chlorine then which is appearing as a residual at the end of the disinfection stage, I would judge that the inactivation caused by the disinfection process is about 90 percent of those viruses that come into the disinfection state.

BY MR. MCCABE:

Q. So we would have approximately 90 percent in the activated sludge phase, plus an additional 5 percent as a result of the phosphorous removal by ferric chloride, and then 90 percent of whatever remained there would be inactivated by the chlorine?

A. Yes, that would total to a removal of about 99 percent for the incoming viruses to that particular plant.

THE COURT: Of the ones that reach the secondary treatment stage?

THE WITNESS: Yes.

BY MR. MCCABE:

Q. When you spoke of a trace of free chlorine, what did you mean by a trace? What type of measurement were you referring to in the records?

A. The records show a measurement of free chlorine for '76 by both the empirimetric [sic] method and the orthotolidine method. The monthly averages show more free chlorine by the orthotolidine process or method of measurement than by the empirimetric [sic]——

* * *

THE WITNESS: I indicated that I was basing this on an examination of 1976 operating records for the Jones Island Treatment Plant.

* * *

BY MR. MCCABE:

Q. Doctor, you indicated that you felt there would be approximately a 90 percent reduction in the activated sludge portion. Did that include or exclude the primary—I am sorry. There is no primary settling basin at Jones Island.

Doctor, have you made a similar evaluation of the data for the South Shore Treatment Plant?

A. Yes, I have.

Q. Do you have an opinion as to the approximate range of percentage removals to be achieved at the South Shore Treatment Plant represented by the data which you have reviewed?

A. Yes, in the activated sludge phase, the removal should be on the order of 90 percent, with an additional 50 percent removal of those viruses by the phosphate precipitation.

At the South Shore Treatment Plant, I think that the removal of viruses or the inactivation of viruses in the disinfection stage would be higher than that at Jones Island, in excess of 90 percent, perhaps as high as 99 percent.

Q. In terms of the South Shore Plant, the South Shore Plant has a primary sedimentation basin in addition to the activated sludge section of the plant, does it not?

A. Yes.

Q. Do you feel that that primary sedimentation basin would produce an additional degree of removal beyond the 90 percent plus 95 percent?

A. Yes, I do.

Q. What would that be?

A. It should be on the order of 90 percent.

Q. So there would be roughly 90 percent in the primary settling basin and then between the secondary treatment, when that is combined with the phosphorus removal, that would mean an additional 95 on top of

the original 90, and then the chlorine inactivation would represent another 90 to 99 above that?

A. Yes." (Sproul, Tr. pp. 10467-74)

One of the most vexing problems is to determine a cause and effect relationship between a discharge and the quality of the water into which the discharge is made. That problem is illustrated in the following portion of the record and by the change in the federal statutory approach to water pollution. The initial approach of the federal statutes was based on water quality. When that approach proved ineffective the statutory basis was changed to effluent specifications. Yet, the trial court acted on what it perceived to be a possible water quality problem over "geologic time" (A-Ap.p. 49) even though the experts were really unable to conclude with any certainty that the result feared by the trial court would occur. Instead of requiring plaintiff to prove that the lake was adversely affected, the trial court again held against the defense for failing to prove the negative; i.e., that water quality would not be adversely affected.

"THE COURT: I don't fully understand your statement, Dr. Katz, that the standard has nothing to do with water quality.

It is intended to achieve some kind of water quality or they wouldn't do it in the first place, isn't that right?

THE WITNESS: The connection goes something like this, that if we can get the gross pollutants out, let's say, through the activated sludge process, the assumption is it is going to help the water quality.

Now if you ask the question what kind of help will you get out of it, that relationship is not known, period. There may be instances in certain localities that they may be known, but the problem is that when you

get into the water quality issue, it is a site specific issue. One cannot administrate a law on a nationwide basis on water quality. One has to begin to then research based on the local conditions in order to obtain the necessary information that might relate discharge standards to water quality.

* * *

THE COURT: Does the matter become less site specific as you think in terms of longer periods of time for water quality?

THE WITNESS: I am not quite clear what the question means?

THE COURT: For instance, Lake Michigan has been said to be in pretty good shape. So I can see where one would say, "Well, quality is not really affected by any particular discharge."

Is that what you are saying?

* * *

THE WITNESS: Did I answer—I think you had a question outstanding.

THE COURT: I just wanted to make sure in my mind that I knew what you meant by water quality, and it seems that I knew what you meant by water quality, and it seems to me to try to restate my own confusion, I can see where you have two different questions, depending on if you are looking at it on a contemporary basis or what could happen over a period of time.

THE WITNESS: May I respond to that?

THE COURT: Yes, go ahead. I am not sure I have made it clear.

THE WITNESS: I think in terms of time and space, there are two issues. You pointed out the time element

in any body of water, and it depends upon whether it is a river or lake and the configuration of the lake and all these other issues, but there is another issue, and that is the space issue.

When you get into a body of water like an ocean or a body of water like Lake Michigan, the other thing you have to establish is whether you have a local pollution or are you talking about whether—you know, it is like saying what is the weather of the United States?

To me the weather of the United States whatever area you want to pick.

You have that issue, too. I am not saying here where we are at, but it is a basic issue.

The longer the time span that you have and the larger the area that you have, then you have to consider other input into the lake besides point of source. You have to consider all input because in the long term the state of Lake Michigan is a swamp, if you want to project the information. That may be 200,000 years from now.

I am not sure—I will speak only for myself—that I am qualified to be concerned for that length of time.

* * *

THE WITNESS: Don't misunderstand my statement, but there is a basic difference. Lake Erie was receiving point sources that were just raw sewage with no issue of a treatment plant involved at all.

I think with the Milwaukee situation, I think the issue is, with us at least, we are going to meet our permit requirements.

THE COURT: But my point was if you just think in terms of the water quality at a specific point, you can

take a deep spot in the lake and put the foulest kind of pollutant there and it won't have any particular effect.

On that basis you could justify any kind of pollution in terms of the receiving body of water being able to handle that at that particular point in time.

MR. MOAKE: Of course, I think what the Doctor is saying with respect to that is until you determine what effect dumping in the middle of the lake actually has on the lake, you are not capable of setting the standard by any rational means.

MR. KARAGANIS: As several witnesses have stated, and the Court has stated, those were the same exact arguments that were used on Lake Erie, "Wait and see what happens."

MR. MOAKE: We are not saying that.

THE COURT: Actually I didn't really mean to get into a broad discussion. I just wanted to make sure I understood what he meant by water quality.

THE WITNESS: The issue is complex, I would agree with you, and I am not sitting here, nor do I think the so-called experts have all the data they need to predict in a quantitative way what is going to happen to Lake Michigan in space and in time. At least I haven't seen that kind of information. (Tr. pp. 11215-12223)

* * *

Q. Isn't it a fact that the Senate Public Works Committee in reporting on Public Law 92-500 emphasized that the reason they wanted to go to discharge standards and move away from water quality standards was this very difficulty that you have mentioned, namely, trying to quantitatively relate what happened when the discharge came out of a pipe and what its impact was on water quality was?

A. It was an administrative nightmare.

Q. As well as a technical and scientific nightmare, isn't that right, because of——

A. Because of a lack of knowledge.

Q. (Continuing)—because of the lack of knowledge and because of the variables that exist within the natural environment, isn't that right?

A. Because of a lack of knowledge." (Katz, Tr. p. 11436)

With respect to the lower court's finding that a continuous free chlorine residual should be required (A-Ap.p. 7), the record shows that there are serious problems with the use and level of chlorine in sewage plant effluent. Thus, it becomes a matter for the experts to balance the results desired against the effects of procedures employed. It is the DNR and the EPA who should, through the permit procedures, make those balancing determinations.

"THE COURT: What would be wrong with just simply putting enough chlorine into the effluent to make sure that you did have a free chlorine residual left over no matter what the solids and no matter what the organics?

THE WITNESS: You could do that, your Honor, but it is expensive, and I say that not in the sense I could give you a cost, but this is a complaint I hear, that it is costly.

There is another problem that you have to deal with, and that is that the chlorine itself forms compounds which, for reasons that have nothing to do with the disinfection, can be a problem. Some of them are carcinogenic, cancer producing. The chloramines themselves are toxic in very low concentrations to fish and aquatic life, so that you have another step that you must take. If you are concerned about the aquatic life

in the area, you may have to neutralize the chloramines. So there is a little more expense there.

That this is terribly expensive, I cannot tell you that. I really don't know what those numbers will be.

There are other ways of disinfecting, too, your Honor. There are things that could be done. One could use ozone, for example. We talk about chlorine because it is most commonly used, but there has been, for a number of reasons, in recent years a great interest in going to other forms of disinfection." (Berg, Tr. pp. 12185-12186).

Chlorination of drinking water within a drinking water purification plant is the method of protecting drinking water supplies and it works.

"Q. So that we can get it straight, for the last 15 years there have been no outbreaks of water borne viral diseases——

A. No.

Q. —that were directly——

A. Explosive outbreaks.

Q. Okay, explosive outbreaks.

A. Implying very large insults and breakdown in treatment simultaneously.

Q. And there are none that can be directly related to a supply of water in a municipality where their supply of water is obtained through a water treatment plant, is that correct?

A. Say that one more time so that I am sure I am answering the right question.

Q. The water treatment plant that supplies water to the municipality, in those situations in the last 15 years

there have been no reported explosive outbreaks of water-borne disease.

A. From any municipal plant that treats its water completely, going through coagulations, sand filtration, chlorination, that is correct, there are no recorded outbreaks that I know about.

Q. And what you just have mentioned, coagulation, et cetera, et cetera, those would be referred to as a conventional treatment plant?

A. Water treatment plant, yes." (Berg, Tr. pp. 12227-12228).

Wellings, who believed that the greatest removal of solids possible was desirable in sewage treatment, identified the St. Petersburg, Florida Northwest Wastewater Treatment Plant (activated sludge) as having high virus removal because "very low" solids were coming out. Significantly, she testified that an effluent having up to 30 mg/l solids is "very low." That is the exact solids levels specified in defendants' discharge permits!

"Q. How does 95 percent removal of viruses relate to the amount of solids in the effluent in such a system?

A. Very closely because their solids removal was up around—well actually, the amount of solids coming out of their plant was 15 milligrams per liter, maybe 30 milligrams, maybe 18, very low solids when it was operating properly." (Wellings, Tr. pp. 13349-13350)

While the trial court stated that it accorded little credence to the Envirex net and shore studies (A-Ap. pp. 33-34) those studies were the *only* evidence in the record of *any* study made on nonconservative pollutants with respect to the geographical limits of the effect of Milwaukee's discharges to Lake Michigan. Mere criticism of the manner in

which those studies were made does not prove the *opposite* of the conclusions reflected.

"Q. All right. Do yau have an opinion as an environmental engineer as to whether you would recommend to your client the expenditure of such an amount of money in order to take out the last 5 percent of BOD and SS in a situation as it prevails in Milwaukee, where it is on Lake Michigan and where we have the river systems we have and so forth, all of the other things that are taken into consideration to which you have testified? Do you believe that such an expenditure would be justified?

A. You asked me if I have an opinion, and my answer is, yes I do have an opinion on that matter.

Q. What is your opinion?

A. Based on the sampling program that I supervised in the Milwaukee metropolitan area, referred to as a net survey, based on the other hard data that I supervised the collection of in the lake, noted as the shore surveys, based on all the other information that I looked at related to this case over the three, four-year period that I have been involved, it is my opinion that the expenditure of that amount of money is not warranted in the case of the Milwaukee situation there at Lake Michigan.

I do not see that the benefit derived to the lake—I just cannot see it—warrants that expenditure of dollars in that particular receiving water situation.

Q. Based on your experience and background and based on all of the studies that you have made and which you have testified to and the literature that you have read and the thought that you have given to this matter, do you have an opinion as to whether the expenditure of $253 million is justified in terms of pro-

tecting the waters of Lake Michigan and the water supply used by the citizens of Illinois in Lake Michigan or the use of the beaches south of the line, state line?

Do you believe such an expenditure is warranted to either protect the water supply of the citizens of the State of Illinois or their use of swimming beaches in the State of Illinois?

A. I do have an opinion, yes.

Q. What is that opinion?

A. Again based on my examination of all of the data before me, the hard data that we generated and the other data that was published, it is my professional opinion that the expenditure of that amount of money, $253 million, is not warranted for the situations that you noted, simply because I have not been able to discern and determine the impact of these discharges from the Milwaukee metropolitan on the lake. At least I can't discern that there is any kind of a serious impact. I just can't see the impact from all my studies.

The problems that are caused in the Milwaukee metropolitan area because of discharges in the lake and that area tend to be localized, as you would expect for any metropolitan area located along a water body.

Beyond that, I just cannot professionally discern a serious impact of our discharges on Lake Michigan.

Q. Do you have an opinion, Dr. Zanoni, based on all of your studies, background and experience and all of the books and documents that you have read, as to which of these parameters that have been discussed would be necessary and recommended to the Metropolitan Sewerage District of the County of Milwaukee for implementation?

A. Of what is noted on the chart there?

Q. Of the parameters all the way from 30/30 30-day average to a 4/5 never-to-exceed, which of those parameters do you think is necessary?

A. My opinion is—

THE COURT: Let me suggest that the question be answered in terms of what is necessary for the benefit of the lake.

THE WITNESS: I was going to respond that way.

THE COURT: Rather than the benefit of the immediate Milwaukee situation, since the witness has already said he feels the problem is localized.

THE WITNESS: In fact, I was going to respond in that fashion.

BY MR. MOERKE:

Q. Please do, Dr. Zanoni, respond in that fashion, if you would.

A. When I conducted the studies in the Milwaukee metropolitan area off of Lake Michigan and the shore studies and looked at all the other data available to me, these data resulted from discharges occurring in the lake at that time and for times previous to the present time. It is my opinion that even considering the discharges going into the lake at the present time—and that is what I am talking about, the discharges going into the lake at the present time—I do not note a serious deterioration or impact of our discharges beyond our local situation.

That is the only thing that I can really relate to because that is what is happening in the lake and that is what I was studying, the discharges going into the lake now and in the past years.

The only comment I can make on 30/30 is that it is the law, I presume, and that would be the main criterion or directive that would cause me to select 30/30; but if you talk about impact on the lake, I can only relate to what is going in the lake now and what has been going onto the lake in the past years. All I can say is based on the evidence I have seen and examined, the impact of these discharges tends to be highly localized, and beyond the local area, I do not see a serious deterioration of water quality.

MR. KARAGANIS: Just for clarification of the record, your Honor, the term "highly localized", is there a geographic limit to what he means by highly localized?

BY MR. MOERKE:

Q. Do you care to answer that question, Dr. Zanoni?

A. Well, we have been using the breakwater structure as a criterion, so in the case of the near-shore waters right off of Milwaukee, I would say the breakwater structure is localized, and possible 500 to 1000 feet outside of that area because that is how far we measured.

This is true of the shore survey. The shore survey we went out 500 feet and 250 feet, and at distances of 500 feet, we could not find evidence of deterioration.

So I am using these numbers as my reference point, and that is what I mean by localized." (Zanoni, Tr. pp. 4978-4983).

The tremendous costs of the remedy ordered as against the permit requirements for BOD and SS and the care with which those cost considerations should be approached is illustrated in the following testimony referring to a report of the Comptroller General of the United States.

"Q. I show you what has been marked for identification as Defendants' Exhibit 1105. Would you identify that document for the record?

A. This document is called "Report to the Congress by the Comptroller General of the United States."

Q. What is the date which is stamped on the front cover?

A. That is dated December 21, 1976, and the title of the document is called "Better Data Collection and Planning is Needed to Justify Advanced Waste Treatment Construction."

Q. I refer you to page 21 and ask you whether you can tell us what is on that page?

MR. MOERKE: I am sorry, your Honor. This is the only copy we have.

THE COURT: That is all right.

BY THE WITNESS:

A. This is a copy of a page showing a diagram of a sewage treatment plant including advance waste treatment. That is what we call a schematic. It is one schematic for one type of advanced water treatment showing primary treatment, showing secondary treatment, and showing advanced waste treatment.

BY MR. MOERKE:

Q. Now, with respect to this document, I would like you to please refer—excuse me just a second.

(There was a brief interruption, after which the following proceedings were had herein)

By Mr. Moerke:

Q. Dr. Zanoni, would you look at page 30 of that document?

A. Page 30?

Q. Yes.

A. All right.

Q. State generally what appears on that page.

A. On this page is a curve showing in a comparative sense the cost for secondary treatment versus tertiary treatment.

Q. Now would you read the second paragraph on page 30, please?

A. The paragraph is referring to this document and states as follows:

> "The following chart shows that with present technology it would cost at least five times as much to remove the last 15 percent of the pollutants in a waste water as to remove the first 85 percent."

Q. And then the chart is a chart on which you could pick off other costs for advanced waste water, is that correct?

A. Well, in a relative sense, right.

Mr. Karaganis: Foor the record, the record should indicate that the chart that is referred in that exhibit comes for another document called "The Economics of Clean Water," by the U.S. Environmental Protection Agency.

The Witness: Dated 1972.

Mr. Karaganis: Dated 1972, not 1976.

The Witness: No. 1972.

By Mr. Moerke:

Q. On page 31, then, would you please read into the record all of page 31, except for—well, yes. Describe the little chart that is there also.

A. It shows the construction costs for existing primary and secondary facilities and for increased capacity, including proposed advanced treatment facilities, for three plants, as of March, 1975.

It compares the Blue Plains, the Alexandria, and the Arlington plants.

The average capacity of the Blue Plains plant is shown as 309 MGD. The cost of existing facilities, as shown here, is $150 million. Under cost of proposed facilities, and a note is given, which says, "Does not include cost of existing facilities," so the proposed facilities costs do not include the existing facilities, and for nutrient removal they are talking about and mention here $335 million. Then under "Increased capacity and advanced treatment, including nutrient removal," it shows $482 million, over and above the $150 million for the Blue Plains plant.

There is a note here under "Nutrient removal, Blue Plains plant, Washington, D.C.," which says:

> "$100 million of this amount for nutrient removal has been deferred until a final decision has been made about the need for removing nitrogen."

Under Alexandria, the flow is 54 million gallons per day. The cost of existing facility is $4 million. Nutrient removal, $70 million. Increased capacity and advanced treatment, including nutrient removal, $104 million.

Arlington is $30 million gallons per day. Cost of existing facility, $6 million. Cost of nutrient removal, $36 million. And cost of increased capacity and advanced treatment, including nutrient removal, $64 million.

So if one totals up the costs for these three plants, existing facilities are $160 million, nutrient removal, $441 million, and increased capacity and advanced treatment, including nutrient removal, $650 million.

THE COURT: What is meant by "nutrient removal" as distinguished from existing plant? Isn't there some nutrient removal taking place in the existing plant?

THE WITNESS: There is. There is some nitrogen removal.

THE COURT: What kind of plants have they got?

THE WITNESS: They are talking here about phosphorus removal as one of the main nutrients by chemical addition. The other one they are talking about is nitrogen removal.

THE COURT: Aren't they talking about BOD and suspended solids?

THE WITNESS: That is part of the existing facilities and part of the normal advanced treatment. This is nitrogen removal in addition.

THE COURT: All right.

BY MR. MOERKE:

Q. On page 32, what type of information appears there?

A. Well, this is labeled "High operation and maintenance cost of advanced waste treatment facilities."

It shows the Blue Plains, the Alexandria plants and Arlington again.

Current annual operation and maintenance costs for secondary treatment is shown, and then they have "Projected annual cost after expansion and advanced treatment is installed."

For Blue Plains, the secondary treatment, $13 million per year; advanced treatment, $76 million per year.

Alexandria, $1.2 million for existing secondary; for advanced, $10 million.

Arlington, current existing secondary treatment, $1.4 million; advanced, $4.4 million.

If you total these up, as they did here, the current annual operation and maintenance costs for secondary treatment would be $15.6 million per year. The projected annual cost after expansion and advanced treatment is installed is $90.4 million.

The ratio here is approximately 6 to 1.

Q. How do these operating costs compare with the operating costs which you and Mr. Gupta calculated and which you testified to on direct examination?

* * *

BY THE WITNESS:

A. Basically what we see here, if we compare secondary to advance, we are talking about 6 to 1, and the cost we projected for the Milwaukee situation, if you compare existing cost to projected cost for the 4/5 never to exceed, you are talking approximately 3 to 1.

So we have a 3 to 1 ratio from existing to advance, and they have a 6 to 1 ratio from existing to advance.

That is all I can say about it in a relative sense.

BY MR. MOERKE:

Q. With respect to the Blue Plains Plant, I believe you stated from the record here that it was 305 million gallons?

A. 309.

Q. 309, and you calculated the flows in the Milwaukee situation and you lumped the two plants together at 320 million gallons a day, did you not?

A. That is correct, our costs were based on 320 million gallons a day.

Q. I would refer you to page 35 of Defendants' Exhibit 1105 and ask you, Dr. Zanoni, to just read into the record the conclusions and recommendations stated in that report?

A. I am reading from page 35. Under recommendations it states this:

"We recommend that before approving grants for constructing expensive advance waste treatment facilities, the Administrator of EPA determines that:"

And the first item is:

"All water pollution control alternatives have been considered.

"2. Adequate information has been obtained on expected water quality improvements, high initial capital costs, and annual operation and maintenance expense and sludge disposal problems that may result." (Zanoni, Tr. pp. 5721-5730).

The following exhibits indicate that the standards imposed by the trial court are not reasonable and necessary:

Defendants' Exhibit No.

3 — "A Virus in Water Study of Finished Water in Six Communities"

34 — "Virus Study for Drinking Water Supplies"

1357 — 1977 Jones Island Permit

1358 — 1977 South Shore Permit

1105 — Report to Congress (Comptroller of Currency)

1383 — Lake Co. Health Release

1384 — Letter re: Lake Co. Health Dept. Meeting

The following exhibits contain water quality data (fecal coliform counts) which show that, from a health standpoint, the water quality of Lake Michigan is good when compared to bathing beach standards. Lake Michigan's water quality is of course, found to be in that good condition with effluent standards which exist under the present permit operating requirements, even though, as Illinois and the court below noted, those standards have not been met consistently as they will be under the DNR requirements.

Defendants' Exhibit No.

67, 70, 71, 71-A	U.S. E.P.A. data
129, 130, 131, 132, 134 A-D, 154	Illinois E.P.A. data
1035, 1037, 1038, 1039, 1040, 1106	Chicago Water Dept. surveys
1087	Illinois E.P.A. data

B. Wellings And Berg Have Insufficient Bases Upon Which To Opine About The Efficiency Of Wastewater Treatment Plants, Much Less To Opine About The Operation Of Drinking Water Treatment Plants; Wellings And Berg Are Not Sanitary Engineers And They Have Not Tested Lake Michigan Or Drinking Water Treatment Plants.

At paes 49, 50, and 51 of the plaintiff's memorandum, Wellings is cited as support for various propositions concerning wastewater treatment plant operations and efficiency. The following citations to the transcript show that Wellings does not have sufficient background as to the *operation* of a sewage treatment plant to opine as she did thereon and they further show that the samples that she has taken, and upon which she bases her conclusions, are invalid because of the sampling and testing procedures she used.

Concerning Wellings' "tests" of sewage treatment plants:

> "Q. And your answer, [that she has not tested in the Lake Michigan area] would be similar as to sewage treatment plants, would it not?
>
> A. Yes, up in this area, right? (Wellings, Tr. p. 13346)
>
> * * *
>
> Q. How many tests do you feel you have run on primary effluent?
>
> A. Well, that would fall probably close to hundreds. To explain, we would just go through the plant and pull up samples. We didn't start out to do a treatment plant efficiency study. We started out to find out roughly was there a lot of virus coming in this plant, did it proceed through the plant—not quantitatively. We weren't interested.
>
> My interest is in what is coming out in my secondary effluent that is going to be sprayed on the ground. That was my interest. I would have designed experi-

ments quite differently had I been doing an efficiency study of a plant, and so I think to try and take my data and apply it to an efficiency of a plant is sort of misuse. (Wellings, Tr. pp. 13382-83).

* * *

Q. Now, when you ran tests on raw sewage, did you simultaneously run them on chlorinated and non-chlorinated effluents?

A. We took a series of samples. When you say simultaneously, I don't know what you mean. What we did was to go into the plant. Many times I would go in myself and collect the influent and primary and even some of the sludge off the aerators, and so on and so forth, through the plant, stick them in my car and go to the lab, and then we would process them.

Q. Did you ever attempt to relate the strength of an influent over time to the effluent, either chlorinated or unchlorinated?

A. No. But after sitting here through all of this, I thought, well, I should go back and write a paper on all the data I have accumulated, because it is probably more than anybody in the world has at the moment on these types of plants, and perhaps if I carefully evaluate the data and get the plant records and tie it all together, it would probably be interesting reading.

Q. You haven't done that yet, have you?

A. But I have not done that, because I am not interested in it, really.

Q. You have never attempted to tie plant records to influent or chlorinated effluent or unchlorinated effluent?

A. I really don't care.

MR. KARAGANIS: Plant records, Mr. McCabe?

THE WITNESS: When you say "records"——

By Mr. McCabe:

Q. Plant operation records.

A. I have looked at some solids data, suspended solids data, but to relate it quantitatively, never.

Q. Never?

A. No. (Wellings, Tr. pp. 13386-13387)

* * *

Q. My question, and I am sorry if I confused you—I certainly didn't mean to, and I apologize if what I indicated seem to be unfair—but in terms of sludge age, I am referring to the fact that when sludge, or when effluent moves from the primary settling basin into the secondary portion of the treatment plant, when that effluent moves into the secondary portion, a certain amount of return sludge from the clarifiers is added to that effluent, is it not?

A. Yes. It is to keep up the bacterial growth and that kind of thing. To keep it operating.

Q. That mixture is put into the aeration basins and aerated for a certain length of time, and moved from the aeration basin into the clarifier, a certain percentage of those solids being taken off and wasted, a certain percentage being shunted around back to where they began and added to any effluent, back in the aeration basin, and this process goes on for some time?

Now, how long, in that sense, not in the digester sense, is the average—in quotes—particle of sludge in a secondary treatment portion of a plant?

A. I don't know, I am not a sanitary engineer. I cannot tell you.

Q. Without that knowledge, are you able to come to any quantitative estimate at all of the percentage removal efficiency of a plant?

A. Earlier on I said that I had not tried to define the percent removal within plants, except in that one thing, where we talked about that it looked like 90 percent or 90 some percent. But I am only interested in what is coming out the other end. That is the crux of the matter, where it is going onto the ground, whether it is going into a deep well, or whether it is going to be discharged to surface water. It is how much is being discharged." (Wellings, Tr. pp. 13398-13399)

Wellings has *never* attempted to determine what benefits, if any, might be obtained by requiring a discharger to meet a 5/5 standard rather than some other standard, such as the 30/30 standard which she herself characterized as "very low" solids. Her generalized guesstimates about what she "would like to see" in the way of solids removal provide no support for the 5/5 standard ordered by the lower court.

"Q. Have you ever tried to correlate the number of viruses per liter in secondary effluent to the solids and/or BOD in that effluent?

A. Not really.

Q. Not really?

A. No, in measured terms, no.

Q. Chlorinated or unchlorinated?

A. Chlorinated or unchlorinated.

MR. KARAGANIS: I am sorry, Doctor. I didn't get your answer.

THE WITNESS: Chlorinated or unchlorinated.

MR. KARAGANIS: Did you say in measured terms?

THE WITNESS: In measured terms, yes.

BY MR. MCCABE:

Q. Is that a qualification to my question? In other words, in measured terms, have you ever tried to do it in any sense?

A. Well, how else could you do it except in measured terms? I don't know. (Wellings, Tr. pp. 13399-13400).

* * *

Q. Do you have any knowledge as to whether or not viruses are inactivated as opposed to being removed prior to chlorination in an activated treatment plant?

A. All I can answer that with is you get viruses out of the unchlorinated, and we get them out of the chlorinated plaque forming units, which means they are visible. You lose some viruses through there.

You know, viruses have a life span. I don't know that the life span is. Neither does anybody else—under certain conditions. So that die off of those viruses would be so varied, it depends on what they are in and what the temperature is and how much moisture is there, and there's so many variables.

Q. Are there any factors besides temperature and moisture in a sewage treatment plant prior to chlorination—we will exclude chlorination from this.

A. Well, some work—what was it—Ward did recently show some, but this is again pilot plants, little experimental models, some ammonia that can inactivate viruses, if they are free. It can't touch them if they are in a solid.

Q. Do you know of anything else that might inactivate a virus in a secondary treatment plant?

A. I suppose an amoeba might pick up a piece of solid or something if he had something to eat there. I don't know. . . . (Wellings, Tr. pp. 13404-13406)

* * *

Q. With respect to the solids on the days that you saw solids coming in, solids going out, either zero removal or more coming out—I am sorry. Virus are coming in, virus going out at the same level or a higher level, were there also high levels of solids associated with the effluent?

A. I did not go back and check these. I didn't measure it." (Wellings, Tr. pp. 13431-13432)

At pages 53, 54, 105 and 106 of the plaintiff's memorandum, Berg is cited as support for various propositions concerning wastewater treatment plant operations and efficiency. However, Berg's knowledge about sewage treatment plants and their operation is sorely deficient, and his sampling and testing procedures were void of any scientifically respectably methodology. There is no reason to give any credence to his conclusions.

"MR. MCCABE: You spoke of a particular series of tests which you have in mind. When were those series of tests run?

THE WITNESS: They were run, if I recall correctly, in the second part of 1975, '75, yes. I believe that was it.

MR. MCCABE: So you ran a series of tests in the second part of 1975 off of some sewage from the Sycamore Plant in Cincinnati?

THE WITNESS: Most of them were from Sycamore. There were, I believe, two other plants involved.

MR. MCCABE: Did you go out and get the samples yourself?

THE WITNESS: No, I did not.

MR. McCABE: Do you know how they were obtained?

THE WITNESS: They were obtained by technicians.

MR. McCABE: Sanitary engineers or virologists?

THE WITNESS: Virologists.

MR. McCABE: Did they have any sanitary engineering training?

THE WITNESS: No.

MR. McCABE: How large were the samples?

THE WITNESS: Oh, I would imagine probably——

MR. McCABE: Do you know?

THE WITNESS: I can tell you the size of the samples that we tested usually running somewhere around 200 ml's to a liter, perhaps 2 liters. A total amount that they usually pick up runs into several gallons.

MR. McCABE: What type of plant is the Sycamore plant?

THE WITNESS: The effluents we took at this time were primaries—raw sewage, I am sorry.

MR. McCABE: Raw sewage?

THE WITNESS: Yes.

MR. McCABE: So you tested in the latter half of 1975 some raw sewage from a treatment plant?

THE WITNESS: Yes. (Berg, Tr. pp. 12033-12035)

* * *

Q. Doctor, I can go back over your specific literature experiences, but generally would you tell the Court what experience you have had in measuring removal

efficiencies of primary plants, secondary plants, and activated sludge secondary plants?

A. Yes, over the years, for one reason or another, we have sampled effluents at these plants, sometimes as part of surveys, sometimes for other reasons. We have also done a certain amount of work in the laboratory with some sundry procedures.

Q. With respect to your experience with an activated sludge plant, would you give the Court your opinion or your experience of—I am sorry, not your opinion but your experience—with respect to the removal efficiencies of viruses from activated sludge plants that you have studied?

MR. MCCABE: Objection, your Honor. I think we ought to go into that a little bit more.

THE COURT: I think so.

BY MR. KARAGANIS:

Q. Would you describe what activated sludge plants you have studied?

A. I couldn't give you any detail on them. We have studied plants going back over the years.

Q. All right.

A. I can tell you what the general experience is that we have had, but I couldn't cite for you right now without going back into the data books where those plants were even.

Q. Were they various plants around the country?

THE COURT: Tell us the methodology that was used to survey them.

THE WITNESS: Your Honor, the methodology has changed over the years, so I couldn't even tell you ex-

actly what methods we happened to use. I could make a guess, but that would be all I could do, methods by and large less efficient than we have available today.

THE COURT: Just basically, would you obtain samples from these various plants?

THE WITNESS: Yes, we obtained samples from the primary effluents and from the secondary effluents and we would measure them coming out.

BY MR. KARAGANIS:

Q. So you would measure the liquid portion of the primary effluent without measuring the solids that were down below?

A. That is correct.

Q. Then you would measure the effluent from the activated sludge plant?

A. That is correct. (Berg, Tr. pp. 12051-12053).

* * *

Q. Now with respect to the tests for the monovirus in primary sludge, you indicated that your response—not in primary sludge, in raw sewage—you indicated your response was based on a number of tests you did in late 1975?

A. Yes.

Q.Once again you were not sure where those samples were taken in the sewage treatment plant?

MR. KARAGANIS: Objection, your Honor. He did not say he was not sure, and I am not going to suggest that that was not his testimony yesterday that he was not sure where the samples were taken.

Mr. McCabe asked about whether they were before bar screens or fine screens or whatever the case, but

the witness testified as to primary influent, raw sewage.

THE COURT: Overruled, he can answed the question.

THE WITNESS: Well, as I said to you yesterday, after the initial comments, when my people go into the sewage treatment plant, they are not free to roam around any way they like. They ask for what they want, and it's given to them or they are told where to get it.

Now, I do not know exactly where it came from, but they were given what was supposed to be raw sewage. (Berg, Tr. pp. 12144-12145).

* * *

Q. Whereas, your tests in the activated sludge process in plants involve something like the following:

You go to the head of a plant or you send someone out to talk to the plant operator and say "Give me a sample of the effluent going into the secondary portion of the plant and then give me a sample of the effluent coming out of the secondary portion of the plant," is that correct?

A. That is the kind of thing that has been done in the past. You are correct.

Q. And that is the kind of thing that you did in determining zero, 50 or 80 percent removal, is that correct?

A. In most of those determinations this is what was done. We are saying that they were done at the same time. Is that what you are alluding to?

Q. I am asking if that was the procedure.

A. Yes, the samples were taken at essentially the same time.

Q. You walked from one end of the plant to the other end of the plant, took one sample at one end and took one sample at the other?

A. That's correct.

Q. That is a hardly scientifically respectable manner of determining percentage removals, is it?

MR. KARAGANIS: Objection, your Honor.

THE COURT: Overruled.

BY THE WITNESS:

A. Counsel is making a good point. I am well aware of it. We didn't think about it during the early studies, but it is true that the sewage moves through the plant, and there are going to be certain variations in the level of virus that you expect during different times of the day, because people normally tend to move their bowels at more or less regular times. So the point is well taken.

I expect that the numbers will be different at different times of the day, but I don't think that they are going to be so different that you can't get some kind of reasonable estimate.

You are quite correct. The better way to do that kind of thing, if you can, is to try to determine how long it takes that material from the influent to get to the effluent and to temporarily adjust the sampling to those schedules.

BY MR. MCCABE:

Q. Are you saying, then, Doctor, that it would have been better to—let's call this the pipe leading into the secondary or activated sludge portion of the plant, (drawing), and this will be the aeration basin, and

that will be the clarifier, and this is the effluent channel.

Are you saying that it would have been better to determine how long it takes the liquid entering at X to move through the aeration basin to the clarifier and over to point Y, which would be the weirs, or the point where the liquid moves out of the clarifier? In other words, determine a, the length of time it takes to get over to Y. That would have been better procedure?

A. This would have been the better procedure, and it has been done. But you must understand it is not a perfect procedure, because engineers do this kind of thing from time to time, and we know that the stuff doesn't move through as a slug, that there is a certain amount of short circuiting, that some get through faster, that some does not get through as well. So you end up even here with a certain amount of averaging out. But I think on the whole this would be the better procedure.

Q. Do you have any idea how long it would take an effluent moving from point X to point Y?

A. I think it depends upon the plant. I couldn't give you estimate, but I don't think it is going to be the same in all plants.

Q. Are you familiar with the process of activated sludge?

A. In a general way. I am not an expert on activated sludge.

Q. Are you familiar with the concept of taking a certain percentage of the solids in a clarifier, routing them back to the head of the aeration basin?

A. Yes.

Q. And you realize that this routing process goes on continuously all day long?

A. Some of the sludge goes back.

Q. How much of it goes back from the clarifiers to the head of the aeration basin?

A. I don't know that.

Q. Would it surprise you if I said they took off 90 percent and disposed of it through their sludge disposal process and routed 10 percent back to the head of the aeration basin?

A. It wouldn't surprise me, but I don't know what the amounts are.

Q. Would it surprise you if they took 90 percent off rather than 10 percent and routed it back here (indicating) and only took 10 off?

A. If they took only 10 off?

Q. Right.

A. I suppose I would have to tell you that that wouldn't surprise me, either, but I don't really know. (Berg, Tr. pp. 12150-12155)

* * *

"Q. With respect to chlorine removal, with respect to inactivation of secondary effluents by chlorine, have you ever, first of all, done any of the type of experiment whereby you would measure the amounts of effluent leaving the clarifiers in an activated sludge plant, which is "Y", and then in that activated sludge plant you would have a chlorination, and then take a sample at Point Z?

Have you ever done any sampling of that nature? Do you understand the diagram?

A. Well, you mean as opposed to sampling material coming into the activated sludge plant?

Q. Right, I am talking about samples——

MR. KARAGANIS: You are referring now to Defendants' Exhibit 1398?

BY MR. MCCABE:

Q. I am talking about samples you would take after the effluent has spilled over the weirs on a secondary sedimentation tank, before it moves into the chlorination chamber. Take a sample there and take a sample at Z, which is the point after it leaves the chlorination chamber.

Have you ever done any sampling like that yourself?

A. Personally, you mean?

Q. Yes.

A. Have I gone out and done it?

Q. Have you ever received the samples and worked on them?

A. Yes. We have received samples of that kind over the years, not a great number, but we have.

Q. Which plants would that be in?

A. I couldn't tell you that. Not in Cincinnati. I can tell you that.

Q. How long ago was that?

A. Oh, the studies, I think, have got to go back at least five to ten years, perhaps even more. I can't even remember why we did them.

Q. Do you know the chlorine dose levels that were being given?

A. Well, I can remember specific cases with chlorine readings of about 2 to 3 parts per million, even perhaps just a little bit higher, where we found no de-

tectable losses in the amount of virus. That is the amount going in seemed to be roughly the same as the amount going out, or perhaps I should say it the other way: the amount coming out seemed to be about the same as the amount coming in.

Q. With the same type of bucket sampling, where you take a sample at one end and you take a sample at the other?

A. Right.

Q. How long was the detention time at the effluent pipe?

MR. KARAGANIS: Detention time between Y and Z.

BY THE WITNESS:

A. That is an important factor, but I don't remember exactly. (Berg, Tr. pp. 12174-12177)

* * *

BY MR. MCCABE:

* * *

Q. Dr. Berg, if we could go back briefly to a point that we were discussing this morning in terms of sending people out from your department to select samples for your determinations of the numbers of viruses in raw sewage and for your grab samples of secondary effluent in the sewage leaving the primary section of the plant moving into the activated sludge plant, do you know whether they took their sample from the top, let's say, quarter or two of the influent canals or down at the bottom, whether they took composite samples?

A. No, I don't know.

Q. Would that make a difference, you feel, in the virus counts that you might get?

A. I don't know.

Q. To the extent that the viral particles are attached to solids which may be in the process of settling out or being moved along the bottom rather than up at the top because of their specific gravity, to that extent you would expect to find greater viral concentrations near the bottom rather than at the top, would you not?

A. If you are talking about the total sewage, I think the answer would be yes. But don't forget that by and large the measurements that we have been making have been in the liquid portion." (Berg, Tr. pp. 12193-12194).

Conventional water treatment plants in the U.S. all produce drinking water which is not a hazard to the public health. They may be relied upon to protect the public drinking water. It is not the sewage treatment plant which produces drinking water for the public.

"Q. In your opinion, Dr. Cliver, based on your participation on the committee you just referenced [The Microbiology Subcommittee of the National Academy of Sciences—National Research Council Safe Drinking Water Committee], and based on your examination of those two exhibits, 34 and 3, is the technology which is presently employed in the typical U.S. water facility capable of inactivating viruses to the extent that the drinking water from those facilities does not present a public health hazard?

* * *

Q. Is it your opinion that the answer to that question would be yes?

A. Yes." (Cliver, Tr. pp. 10216 and 10222).

* * *

"Q. Are you familiar with the treatment plants, let us say, in Chicago and Zion and Waukegan, Illinois?

A. I have no close familiarity with those plants.

Q. Dealing with the conventional treatment plant as we have been in the United States——

A. You are talking about water treatment?

Q. Yes. Water treatment. In your opinion, are those water treatment plants, the conventional ones that we have in the United States, currently treating water to such an extent that the water being sent from those plants to the homes in communities through the distribution system does not constitute a hazard to the public health?

A. It does not constitute a public hazard? I would like to answer that question directly, too.

If you are talking about going through the usual settling procedures, pre-chlorination, the coagulation, filtration, and subsequent chlorination, and if you bring the turbidity down to a very low level, to tenths of a part per million, and chlorination is adequate, then I would say that you are probably doing as much as we can do at the present time, the only question being that of what might possibly be coming through in the small amount of turbidity that is coming through, and the other being the possibility of breakdown in the plant, which does happen from time to time.

Q. What you just described is a conventional plant in the United States?

A. It is conventional as I think of "conventional." (Berg, Tr. pp. 12231-12132).

"Q. So that we get it straight, for the last 15 years there have been no outbreaks of water borne viral diseases——

A. No.

Q. —that were directly——

A. Explosive outbreaks.

Q. Okay. Explosive outbreaks.

A. Implying very large insults and breakdowns in treatment simultaneously.

Q. And there are none that can be directly related to a supply of water in a municipality where their supply of water is obtained through a water treatment plant, is that correct?

A. Say that one more time so that I am sure I am answering the right question.

Q. The water treatment plant that supplies water to the municipality, in those situations in the last 15 years there have been no reported explosive outbreaks of water-borne disease.

A. From any municipal plant that treats its water completely, going through coagulations, sand filtration, chlorination, that is correct, there are no recorded outbreaks that I know about.

Q. And what you just have mentioned, coagulation, et cetera, et cetera, those would be referred to as a conventional treatment plant?

A. Water treatment plant, yes." (Berg, Tr. pp. 12227-12228).

"Q. Other than taste and odor problems, have you had any other problems with your water treatment plant?

A. By "problems" what do you mean?

Q. For example, have any other organisms affected your water treatment plant, to your recollection?

A. No." (Goodin, Tr. p. 13535).

Defendants' Exhibit 3, which was a publication resulting from tests at water plants whose source water was badly contaminated, states:

> "The fact that these water treatment systems were challenged by very poor source water on numerous occasions and yet produced a finished water in which no viruses could be recovered seems to confirm the adequacy of good conventional treatment for virus removal." (Def. Ex. 3, p.9)

The evidence of drinking water treatment plant performance is not only clear, it is uncontradicted in the record. Drinking water treatment plants protect the public. Although Wellings raised questions as to their operation, she is without any qualifications to do so:

> "Q. During your direct testimony, you were asked some questions about water treatment plants. Have you ever analyzed the backwater back-filter sludge from water treatment plants for viruses?
>
> A. No, I have not.
>
> Q. What water treatment plants are you familiar with?
>
> A. Well, I am familiar with the Tampa Water Group but not to the point of testing them.
>
> When I made my statement, I made the statement that analogous to treatment plants, in sewage treatment plants, we are using the filter. It's the same principle. You have to backwash, and when you do, you have the possibility of disturbing your filtering.
>
> Q. You have never tested raw water going into any of the Tampa Water plants?
>
> A. Not the major treatment—we will be. We are now funded to do this.

Q. Have you tested the finished water which comes out of the Tampa Water Treatment Plant?

A. Not out of Tampa. We have had no funds to so do." (Wellings, Tr. pp. 13292-13293).

C. Effluent Standards Imposed By Illinois Upon Its Own Dischargers Are Less Stringent Than Those Sought To Be Imposed Upon Milwaukee Here; That Is Clear Proof Of What Illinois Really Believes Is Necessary And Reasonable To Protect The Public Health.

In response to a question at oral argument from this Court concerning Illinois' more lenient effluent standards, Mr. Karaganis asserted that "we don't right now have body contact recreation in the Illinois River." That is a partial, and misleading, description of the actual facts. References should be made to Plaintiff's Exhibit 171, the Illinois Pollution Control Board Rules and Regulations. Section 104 of the Rules defines "Primary Contact" waters to be those for recreation, such as swimming and water skiing, or other use involving considerable risk of ingesting water in quantities sufficient to pose a significant health hazard. Sections 301-303 indicate that the Illinois River downstream from the confluence with the Chicago Sanitary and Ship Canal qualifies not only as primary contact water but also as public and food processing water. According to Section 404 of the Rules, it is permissable for treatment plants in such areas to discharge effluent meeting 30/37 standards (for plants of population service of less than 10,000) or 20/25 standards (for plants with population service of greater than 10,000 where dilution ratio is better than 5:1). The uniform coliform standard under Rule 405 is a maximum of 400 fecal coliforms per 100 ml.

Mr. Karaganis further stated without record support in response to this Court's questions that removal of ammonia was required by the State of Illinois for all plants that have changed their point of discharge from Lake

Michigan to Illinois' rivers. He stated that ammonia removal requires an additional biological process, known as "denitrification," [6] and asserted that this process creates a "different" kind of solid. Mr. Karaganis claimed that treatment plants using the same technology ordered by the lower court could not achieve a 5/5 effluent quality because of the "technological limit" caused by this "different" kind of solid. He contended that no better than a 10/12 standard could be met in that circumstance, ostensibly explaining Illinois' imposition of less stringent discharge requirements upon its own treatment plants than those sought to be imposed upon Milwaukee.

There is no record support for that position and we are advised that there is no meaningful difference in the filterability of solids produced by the ammonia conversion process to which Mr. Karaganis alluded and the solids produced by the process used in Milwaukee. We are also advised that the chlorination effect on a 10/12 effluent which has undergone ammonia conversion is no different than upon a 10/12 effluent which has not undergone ammonia conversion.

In sum, we are advised that there is no technological reason why Illinois could not require its own discharges to meet a 5/5 standard if some genuine public health basis for that standard existed. The effect of chlorine on effluent which has undergone ammonia conversion would be the same as the effect on effluent which has not undergone

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[6] The correct description of the process to which Mr. Karaganis alluded is "nitrification," not "denitrification." The process consists of causing ammonia (which can support weed and algae growth) to be converted into an unobjectionable nitrate compound. Thus nitrogen is not removed. Rather, in those Illinois plants where the process is used there is merely a conversion of one nitrogen compound to another. While there is a "denitrification" process that is sometimes used for a different purpose, the remarks made in this memorandum are equally applicable to the effluent resulting after either process is applied.

that process. Thus, if a 5/5 effluent is actually required to facilitate chlorination with one of those types of effluent, it is required for both types. Conversely, if 10/12 or some lesser requirement will suffice for the Illinois discharges it will certainly suffice for discharges made 25 miles away in Milwaukee. *The plain implication of the relaxed standards which Illinois applies to its own dischargers is that there is no health basis for the greater standards Illinois would impose on Milwaukee.*

Once again, as is indicated in footnote 6, whether the process used by Illinois be nitrification or denitrification, all of the above comments apply. If further evidence on those points is desired, it can be supplied.

D. There Is No Testimony Indicating That A 5/5 Standard Is Necessary To Protect The Health And Welfare Of Illinois Citizens Particularly When The Discharge Source Is A Minimum Of 25 Miles From The Illinois State Line.

The treatment level advocated by Illinois and "desired" by Wellings (Tr.p. 12401) is without foundation. The fact that Illinois does not choose to go to 5/5 in any body of water other than Lake Michigan while providing for effluent standards as high as 30/37 in some at its own waters speaks to the lack of real concern that viruses will pose a problem in Illinois unless a 5/5 is met. The issue of whether or not Milwaukee effluents are diluted before they get to Illinois becomes important and also demonstrates the specious character of the treatment levels advocated by Illinois for Wisconsin point sources. As the uncontradicted record indicates, the nearest discharge point operated by these defendants is the South Shore plant, which is approximately 25 miles from Illinois territorial waters. (Tr. p. 8945) Using variables specified by Illinois' counsel, the dilution ratio for such distance from the South Shore plant was calculated to be 1 to 149. Using more realistic—but nonetheless conservative—variables, significantly higher di-

lution ratios are obtained. (Tr. pp. 8939-8940).[7] Certainly any standard imposed on the defendants in this case ought to take such a substantial dilution factor into consideration, even disregarding sedimentation, predation, and the other factors that would potentially have an adverse impact on viral concentration by the time any effluent could reach Illinois.

Taking the dilution ratio into account, even the 30/30 standard imposed by the DNR would result in parcels of water entering Illinois having BOD and suspended solids concentration levels far less than even the 5/5 standard that Illinois claims here to be required for the safety of Illinois citizens. This point is particularly noteworthy in view of the fact that Illinois, except in a very few instances, does not even require its own citizens making discharges directly into Illinois waters to meet the 5/5 standard urged here.

Illinois divides its waters into two categories: (1) those which it wishes to maintain for general public use, such as swimming and water supply use; and (2) those in which it does not allow general recreation or allow the water to be used as a drinking water source. (Pl. Ex. 171)

The first use is designated as primary contact, the second as secondary contact. "Primary contact" means any recreational or other water use in which there is prolonged and intimate contact with the water involving considerable risk of ingesting waters in quantities sufficient to pose a significant health hazard, such as swimming and water skiing. "Secondary contact" means any recreational or other water use in which contact with the water is either incidental or accidental and in which the probability of ingest-

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[7] Low dilution ratios found in the early parts of the trial transcript relate to CSO and storm water run-off from the Milwaukee River as distinguished from sewage plant discharges which experience much higher dilution ratios in the lake.

ing appreciable quantities of water is minimal, such as fishing, commercial and recreational boating, and any limited contact incident to shoreline activity. (Pl. Ex. 171 p.5, Ill. Poll. Control Bd. Rules & Reg., Ch. 3: Water Poll.)

A *water* of the state meets the primary contact definition when the water meets what Illinois terms general standards set forth on pages 9-14 of plaintiff's exhibit 171. Note that this is a *water quality* standard, that is, the Illinois water *after* it receives all effluent discharges (both point and non-point sources) must meet that standard. The only direct bacterial standard for Illinois "primary contact water" is set forth in Section 303(g) of the section entitled "General Standards" at page 10:

> "(g) Based on a minimum of five samples over not more than a 30-day period, fecal coliforms (STORET number—31616) shall not exceed a geometric mean of 200 per 100 ml., nor shall more than 10% of the samples during any 30-day period, exceed 400 per 100 ml." (Pl. Ex. 171, Part II, Water Quality Standards, Sec. 203(g), p. 10)

Thus, Illinois permits a fecal coliform count *in* its primary contact waters far in excess of what the lower court imposed as an upper limit on Milwaukee's *discharges*! It should also be noted that not only does Illinois place such liberal limits on its own water quality, it does so in terms of a *geometric mean*. Contrary to the assertions of counsel for Illinois at oral argument before this Court, a geometric mean cannot be less than the lowest number encountered. A geometric mean is defined as the *nth* root of the product of n positive numbers. That definition precludes a mean less than the lowest number encountered.

The effluent standards which Illinois requires of its own municipalities are set forth in Part IV of plaintiffs' exhibit 171. They include, among other parameters, BOD_5, suspended solids, bacteria, and phosphorus. The only standard associated with bacteria found in Section 405 follows:

> "Bacteria. No effluent governed by this part shall exceed 400 fecal coliforms per 100 ml. after July 31, 1972 except that effluent discharges to the Ohio and Mississippi Rivers shall meet this requirement by December 31, 1973." (Pl. Ex. 171, p. 25)

At Section 407, there is a phosphorus limitation for discharges to the Lake Michigan Basin of 1 mg. per liter after December 1, 1971. This is the same standard required of the plaintiffs through the State of Wisconsin discharge permits. (Pl. Ex. 171, p. 26)

At Section 404(h) the State of Illinois specifically allows up to 5% of the samples collected to exceed by 2.5 times the numerical limits prescribed by the rule (Pl. Ex. 171, p. 25). This means that for 5% of the time or 1½ days per month, Illinois permits up to 25/30 even in those areas it nominally limits with its 10/12 standard for BOD and suspended solids. This is in stark contrast to the lower court's requirement that defendants' discharges *never* exceed a 10/10 standard (A-Ap. p. 7).

Notably missing from the Illinois' requirements, which are aimed at protecting the health and safety of its own citizens, is any virus limitation.

For further discussion of Illinois' undisputedly less stringent discharge limits, and related legal principles, we refer the court to pages 4-12 of the City of Milwaukee's original brief herein.

E. Illinois Regulations Permit Sewage Overflows Into Lake Michigan Which Do Not Even Meet A 30/30 Secondary Standard, Much Less The More Stringent Standards, Sought To Be Imposed Upon Milwaukee Here; That Is Clear Proof Of What Illinois Really Believes Is Necessary And Reasonable To Protect The Public Health.

Section 602 of the Illinois regulations specifically allows combined sewer overflows and treatment plant bypasses. (Pl. Ex. 171 pp. 30-31) Discharges from overflows and bypasses do not have to receive secondary treatment, much less advanced waste treatment. (*Id.*)

For example, the City of Waukegan discharges overflows into Lake Michigan:

> "By Mr. Moerke:
>
> Q. Mr. Riddell, what happens if this plant receives more than it can handle?
>
> A. The plant is provided with a relatively large retention basin having a capacity of about 40 million gallons as compared to the nominal plant capacity of about 20 million gallons.
>
> * * *
>
> Our best estimates are that about twice a year at the present time, and reducing to about once a year in the future, the flow will be so great and of such duration there will be some discharge from these basins to the lake.
>
> * * *
>
> Q. There will be times when the plant will—you anticipate bypass to the lake notwithstanding the fact that it has an equalization basin?
>
> A. We anticipate that initially twice a year and ultimately about once a year there will be overflows which have received what is the equivalent of primary—somewhat more than primary treatment. They will have

had approximately ten hours of sedimentation in these basins plus chlorination." (Tr. pp. 13444-13445)

In contrast to what Illinois requires of its own dischargers, it seeks to impose upon Milwaukee a system composed of *complete* elimination of overflows and bypasses without *any* consideration of the cost or availability of federal funds to finance such a system. (A-Ap. pp. 60, 64) This is but another example of the imposition on Milwaukee of a standard of conduct which Illinois does not require of itself or its own citizens.

CONCLUSION

With the filing of this memorandum this Court will have before it: (1) the record; (2) the positions of the parties taken in the original briefs; and, (3) the memorandums filed in response to the May 26, 1978 order.

Faced with this material, with the charges and countercharges of the parties, with the disputes as to what the record establishes, this Court may properly pose the question—How are we to ultimately deal with this case?

The defendants submit that the one analysis of the proceedings below that involves no dispute over what is in the record must lead to reversal. This analysis starts with the legal trueism that in order for plaintiffs to prevail they must have introduced some evidence with respect to the actual state of Lake Michigan water within the jurisdiction of each of the plaintiffs. Lake Michigan is out there; its waters are available for scientific analysis. Testing procedures to prove the existence of the dangers speculated upon by the witnesses are known and available. Yet plaintiffs chose to do no such testing—a choice which the District Court characterized as having been made out of fear over the results (A-Ap. p. 34). Are there viruses in Lake Michigan waters? Are there pathogenic bacteria in Lake Michigan

waters? The best that can be said for the record before this Court is that no one really knows and that the plaintiffs did not prove what was there and did not want to find out for sure.

Is it really too much to require that the plaintiffs come forward with some evidence of actual conditions in the lake? This was the type of evidence required by the Supreme Court when it has had occasion to deal with similar issues. Before a court imposes liability for untold millions of dollars of expense should it not know what the real danger is? Should it not at least require that an attempt be made to determine the existence of these alleged dangers?

Our original brief quoted the lead cases of the Supreme Court of the United States for the proposition that the speculations of experts cannot withstand against known and observable facts before the court. Here all physical tests taken in Lake Michigan negate the existence of pathogens in Illinois waters, and the fact that there has been no outbreak of any water-borne infestions or diseases in Illinois certainly negates any claim that a hazard exists or has existed in the last hundred years that Milwaukee has been discharging effluent to Lake Michigan 25 miles away from Illinois.

Where a party claims that a hazard exists requiring injunctional intervention at hundreds of millions of dollars in cost, and that hazard has existed for a hundred years, the language and logic of the Supreme Court in *North Dakota* v. *Minnesota*, 263 U.S. 344, 385-388 (1923) should put an end to the controversy:

> "It is difficult for a court to decide issues of fact upon which experts equal in number and standing differ flatly, and when their conclusions rest on estimates upon the correctness of which the court, without technical knowledge, cannot undertake to pass. In such cases, the court looks about for outstanding facts from

which the lay mind can safely draw inferences as to the probabilities.

* * *

To attribute to such a minor but constant artificial incident a phenomenal effect for two whole summer seasons without a recurrence since is to fly in the face of all reasonable probability. The evidence must be clear and convincing indeed to support such a theory. Instead of that, it is a combination of estimates and conjecture based on no accurate knowledge of the flow of the Mustinka before the ditches were put in, and depending greatly on a hypothetical detaining basin in the so-called Delta zone, existence of which the greater weight of the evidence negates.

* * *

The conclusion we have come to on the main issue of fact—that Minnesota is not responsible for the floods of which complaint is made—makes it unnecessary for us to consider this evidence as to a practical remedy for them, and requires us to leave the opinions and suggestions of the expert engineers for the consideration of the two states in a possible effort by either or both to remedy existing conditions in this basin."

While thousands of pages of transcript and hundreds of exhibits have been adduced, a review of the record as a whole does not establish a clear right to relief such as to cause this Court to reach the necessity of deciding the effect of the Federal statutes and the underlying administrative action upon the federal common law nuisance the plaintiffs' attempt to establish.

As the Supreme Court has repeatedly held, the speculations of experts do not rise above the demonstrated and demonstrable facts. Here the facts are clear. No pathogens have been shown in Illinois waters. No effects of pathogens

have been shown in Illinois. No accelerated eutrophication resulting from defendants' discharges has been shown in either Illinois or Michgan territorial waters. All we have is expert versus expert in a never-ending and inconclusive chain of speculation.

It is respectfully submitted that on this record the Court should reverse and remand with directions to dismiss for failure to prove a federal common law nuisance without reaching the complex legal issues presented by the statutory impact of the Federal Water Pollution Control Act Amendments of 1972 and the Clean Water Act of 1977 (and their regulatory progency) upon whatever federal common law cause of action may now remain.

In the event, however, that the Court does reach that legal issue, we rely on our briefs previously filed herein for the proposition that the federal courts in determining a case of federal common law nuisance are controlled by the federal statute in the manner and form set out in those briefs. This requires reversal of the trial court possibly with directions to enforce the permit requirements of the permits issued to defendants if this court does not consider the question of enforcement mooted by the stipulated judgment entered by the circuit court of Dane County Wisconsin which judgment was stipulated to under the auspices of the permit-granting authority pursuant to the federal statute.

Respectfully submitted,

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Reply Memorandum of Plaintiff-Appellee State of Illinois to the United States Court of Appeals for the Seventh Circuit

UNITED STATES COURT OF APPEALS
FOR THE SEVENTH CIRCUIT

No. 77-2246

PEOPLE OF THE STATE OF ILLINOIS, *Plaintiff-Appellee,*

and

PEOPLE OF THE STATE OF MICHIGAN,
Intervening Plaintiff-Appellee,

v.

CITY OF MILWAUKEE, THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE, and THE METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE,
Defendants-Appellants.

Appeal of the United States District Court for the Northern District of Illinois, Eastern Division
Hon. John F. Grady, Presiding

REPLY MEMORANDUM OF PLAINTIFF-APPELLEE STATE OF ILLINOIS

Introduction

Whether motivated by excessive zeal or misdirected advocacy, the defendants have attacked the decision of the District Court by a hodgepodge of thinly disguised ploys. The defendants' responsive memorandum:

1. either knowingly or negligently misstates the law;
2. deliberately misstates the facts; and
3. engages in unwarranted and unjustified attacks on the qualifications of plaintiff's experts.

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Indeed, the entire responsive memorandum represents a step backward by defendants. At oral argument on inquiry by the Court, the defendants' counsel acknowledged that viruses and other pathogens are discharged by Milwaukee into Lake Michigan.[1] In their responsive memorandum, defendants defiantly deny that human pathogens even reach Lake Michigan at Milwaukee!

Plaintiff State of Illinois will not belabor this Court with an extensive analysis of all of the errors contained in defendants' memorandum. The length of the record makes such a task prohibitive. But the State does submit this brief checklist of corrections to assist the Court in its deliberation.

I

The Defendants Either Knowingly Or Negligently Misstated The Law.

Defendants string cite a series of cases which purportedly support the black letter proposition that "what is authorized by statute or license cannot be a public nuisance." (Def. Mem. pp. 5-6.) Plaintiff has no quarrel with the general proposition that the legislature, if it so desires, can authorize operation of a common law nuisance.[2] But the same black letter source cited by defendants expressly cautions that such authorization must be "clear and unquestionable" (Am. Jur.2d Nuisances § 231.) Moreover, a careful examination of the cases cited by defendants establishes that most jurisdictions—including Illinois and Wis-

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[1] "What we have is the normal spectrum of sewage. That normal spectrum of sewage will contain the various kinds of viruses."

[2] There is some question whether the Illinois legislature could restrict the power of the Attorney General to seek abatement of common law nuisances, since the legislature cannot remove powers which existed at common law. But we will accept—for purposes of this argument only—the proposition that the legislature could do so if it desired.

consin—would not allow an administrative license to bar an action for public nuisance.

For example, defendants attempt to distinguish *Costas* v. *City of Fond du Lac*[3]—which rejected a defense of compliance with administrative requirements—as a private nuisance case not applicable to public nuisance actions. But defendants ignore the subsequent decision in *State* v. *Dairyland Power Cooperative,* 52 Wisc. 2d 45, 187 N.W.2d 878 (1971). There, the Supreme Court expressly rejected a claim that the public nuisance powers of the Attorney General had been curtailed by the creation of a state administrative agency with powers over pollution control. Moreover, in upholding the public nuisance authority of the Attorney General, the Wisconsin Supreme Court decision in *Dairyland Power* cited the *Costas* decision as authority.

Defendants also cite *People ex rel. Scott* v. *Continental Can Co.,* 28 Ill. App. 3d 1004, 329 N.E.2d 362 (1st Dist. 1975), for the proposition that compliance with an administrative license bars a nuisance action as a matter of law. There was no such holding or even dictum in the *Continental Can* case. The *Continental Can* decision correctly held that where the plaintiff offers no evidence of nuisance and rests solely on the pleadings, summary judgment may be entered on the basis of a sworn deposition showing compliance with the permit. The plaintiff put on no evidence whatsoever, and the Court held:

> "Plaintiff did not file any responsive pleadings or counteraffidavits. Consequently, plaintiff's unverified complaint, alleging on information and belief that the defendant was polluting the air and creating a public nuisance by emitting malodorous fumes into the atmosphere, was insufficient to raise a triable issue of fact."
>
> 329 N.E.2d at 364

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[3] 24 Wisc. 2d 409, 129 N.W.2d 217 (1964).

Thus, *Continental Can* does not support defendants' claim that compliance with administrative requirements is a legal bar to a nuisance action.

Indeed, two Illinois decisions have expressly upheld the right of municipal or state authorities to bring nuisance or nuisance-style actions despite so-called "comprehensive" state or federal administrative schemes. *Metropolitan Sanitary District* v. *United States Steel Corp.*, 30 Ill. App. 3d 360, 332 N.E.2d 426 (1st Dist. 1975); *People ex rel. Scott* v. *United States Steel Corp.*, 40 Ill. App. 3d 607, 352 N.E.2d 225 (1st Dist. 1976). While the holding of these cases relates to the doctrine of primary jurisdiction,[4] the decisions clearly emphasize the intent of the Illinois legislature to allow the Attorney General to proceed independent of administrative action:

> "It is equally clear that the Illinois legislature did not intend for the Attorney General to be precluded from seeking judicial relief merely because of the pendency of administrative action. Ill.Rev.Stat. 1975, ch. 14, par. 12, unequivocally states: '. . . The Attorney General has the power and authority, notwithstanding and regardless of any proceeding instituted or to be instituted by or before the Environmental Protection Agency, Pollution Control Board or any other administrative agency, to prevent air, land or water pollution

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[4] Over the years, U.S. Steel Corporation has raised numerous related legal arguments seeking to use the federal or state administrative procedures as a bar to nuisance prosecutions. At various times, these same basic arguments have masqueraded as the exhaustion doctrine, the preemption doctrine, the primary jurisdiction doctrine, the irreconcilable conflict argument, and a host of related legal arguments based on the same facts—the existence of a lenient state or federal administrative scheme substantially less stringent than the remedies sought by the nuisance actions. *See also, Metropolitan Sanitary District* v. *United States Steel Corp.*, 41 Ill.2d 440, 243 N.E.2d 249 (1968); *United States ex rel. Scott* v. *United States Steel Corp.*, 356 F.Supp. 556 (N.D. Ill. 1973).

within this State by commencing an action or proceeding in the circuit court of any county in which such pollution has been, or is about to be, caused or has occurred, in order to have such pollution stopped or prevented either by mandamus or injunction. . . .'"

People ex rel. Scott v. *United States Steel Corp., supra,* 352 N.E.2d at 228

As in their erroneous recitation of Wisconsin and Illinois law on the subject, defendants misconstrue Pennsylvania law as well. Defendants cite a Pennsylvania air pollution decision, *Commonwealth* v. *Glen Alden Corp.,* 418 Pa. 57, 210 A.2d 256 (1965), as authority that the existence of a statutorily created administrative process bars a public nuisance action. But defendants fail to point out the significant difference between the *Glen Alden* air pollution case and the water pollution decision in *Commonwealth ex rel. Shumaker* v. *New York and Pa. Co.,* 367 Pa. 40, 79 A.2d 439 (1951). There, the Pennsylvania Supreme Court expressly held a public nuisance action to abate water pollution was *not* barred by the statutory administrative scheme.

The *Glen Alden* decision distinguished *Shumaker* on the grounds that the Pennsylvania water pollution statute—in terms almost identical to the savings provision of § 505 (e) of the Federal Water Pollution Control Act—expressly preserved pre-existing rights:

"The provision of the Pure Streams Act referred to and upon which Shumaker was based provides:

'It is hereby declared to be the purpose of this act to provide additional and cumulative remedies to abate the pollution of the waters of this Commonwealth, and nothing in this act contained shall in any way abridge or alter rights of action or remedies now or hereafter existing in equity, or under common law or statutory law, criminal or civil, nor shall any provision in this act, or the granting of any

> permit under this act, or any act done by virtue of this act, be construed as estopping the Commonwealth, persons or municipalities, in the exercise of their rights under the common law or decisional law or in equity, from proceeding in courts of law or equity to suppress nuisances, or to abate any pollution now or hereafter existing, or enforce common law or statutory rights.' Act of June 22, 1937, P.L. 1987, § 701, 35 P.S. § 691.701.
>
> "No such provision appears in the Air Pollution Control Act. Accordingly, the Shumaker case is not apposite. Moreover, the absence of such a provision, in light of the similarity of the objects of the two statutes, is a further indication that the Legislature did not desire a dual system of dealing with air pollution."
>
> 210 A.2d at 259-60

Given the existence of savings provisions virtually identical in substance to the *Shumaker* language in both federal and state[5] legislation, it is clear that the Pennsylvania courts would follow the Wisconsin and Illinois courts in holding that a nuisance action was not barred.[6]

Plaintiff could continue with an extended analysis of the other decisions cited by defendants. However, almost all of these cases have as their underpinnings either a fine point of state law or a rote recitation of the black letter rule which provides little further illumination of the issue.

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[5] Beyond the express reservation of Attorney General's powers in Ch. 15 Ill. Rev. Stat. §§ 11, 12, the Illinois Environmental Protection Act also expressly reserves such rights:

> "No existing civil or criminal remedy for any wrongful action shall be excluded or impaired by this Act." Ch. 111½ Ill. Rev. Stat. § 1045.

[6] Indeed, as the *Dairyland Power* decision indicates, Wisconsin would likely reject a repeal by implication argument even if no savings provision remained.

The one exception is the *Jones Falls* decision;[7] and that case—rather than provide insight into the issue—illustrates the logical conundrum of defendants' argument. Defendants argue that:

1. the federal common law nuisance action precludes actions brought under state law;[8]

2. the federal common law of nuisance must find its definition in the statutory scheme created by the Federal Water Pollution Control Act.

If the federal common law of nuisance bars state statutory and common law nuisance actions and yet has its roots in the federal statute, defendants cannot reconcile the explicit savings provision of the statute—§ 505(e) [9]—with the claim of bar. Indeed, the Fourth Circuit in *Jones Falls* held that § 505(e) is an express recognition of the continuing preservation of state common law nuisance actions:

> "Congress recognized the continuing validity of state common law nuisance actions in subsection 1365(e) of the Amendments."
>
> 539 F.2d at 1009, n.9

It makes little difference to the question of liability and remedy if this case is decided under the aegis of federal common law, state common law or state statute. The courts and Congress have recognized the continuing vitality of

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[7] *Committee for Consideration of Jones Falls Sewage System* v. *Train*, 539 F.2d 1006 (4th Cir. 1976).

[8] *E.g.*, counts II and III of the Complaint in the instant case.

[9] "(e) Nothing in this section shall restrict any right which any person (or class or persons) may have under any statute or common law to seek enforcement of any effluent standard or limitation or to seek any other relief (including relief against the Administrator or a State agency)." 33 U.S.C. § 1365(e).

each remedy. *See, e.g., Ohio* v. *Wyandotte Chemical Corp.*, 401 U.S. 493 (1971). The plaintiff need not posit a rationale for the inconsistencies inherent in defendants' "common law of the statute" argument. However, to assist the Court in its articulation of the relationship between the various available remedies, plaintiff suggests the following rationale.

Defendants have contended that the federal common law should bar individualized actions resulting in individualized requirements because the federal common law exists to provide uniformity. But neither the law of nuisance or the Federal Water Pollution Control Act demand uniformity regarding pollution control requirements. Indeed, both the Supreme Court in dealing with federal common law nuisance and the statute recognize the need for individually tailored pollution control requirements to meet local environmental needs.

For example, on the same day that the Court decided *Illinois* v. *Milwaukee,* Justice Douglas wrote the opinion in *Washington* v. *General Motors Corp.*, 406 U.S. 109 (1972). There, the Court held that the states could initiate federal common law actions to abate air pollution. 406 U.S. at 112, n. 3. The federal common law nuisance action existed in the face of the then existing Clean Air Act of 1970, 42 U.S.C. § 1857 *et seq.*, a statute whose structure and administrative scheme served as the basis for the 1972 Federal Water Pollution Control Act Amendments. Justice Douglas also took note of the savings provisions of 42 U.S.C. § 1857h-2, which is virtually identical with § 505(e) of the subsequently passed water amendments:

> "Moreover, citizens, States, and local governments may initiate actions to enforce compliance with federal standards *and to enforce other statutory and common-law rights.* 42 U.S.C. § 1857h-2."
>
> 406 U.S. at 115, n.4 (emphasis added)

Justice Douglas went on to explictly recognize the need for individually tailored pollution control requirements to meet local environmental needs.

> ". . . [M]easures which might be adequate to deal with pollution in a city such as San Francisco, might be grossly inadequate in a city such as Phoenix, where geographical and meteorological conditions trap aerosols and particulates.
>
> "As a matter of law as well as practical necessity corrective remedies for air pollution, therefore, necessarily must be considered in the context of localized situations. We conclude that the causes should be heard in the appropriate federal district courts."
>
> 406 U.S. at 116 (footnotes omitted)

The Federal Water Pollution Control Act also recognizes the need for individualized pollution control requirements. The so-called secondary treatment standard of "30/30" established pursuant to § 301(b)(1)(B) is a national minimum standard which has no relationship to local water quality needs. Even defendants acknowledge this failure of the 30/30 to address water quality.

> "So I think it is rather obvious, at least to me that 30/30 has nothing to do with water quality." [10]
>
> ". . . [T]he problem is that when you get into the water quality issue, it is a site specific issue. One cannot administrate a law on a nationwide basis on water quality. One has to begin to then research based on the local conditions in order to obtain the necessary information that might relate discharge standards to water quality." [11]

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[10] Testimony of William Katz, the defendants' director of research. (TR 11214).

[11] *Id.*, at TR 11215-16.

Tailoring pollution control requirements to individual water quality needs is typically an *ad hoc* process addressed to a specific water body and specific dischargers. The legal mechanisms for such tailoring are legion.

1. The EPA Administrator can adopt "water quality related effluent limitations" under § 302 of the FWPCA, 33 U.S.C. § 1312.

2. The states can adopt maximum daily loads of pollutants to be discharged pursuant to § 303(d) and make point source allocations under 40 C.F.R. § 131.11.

3. The states can adopt non-water quality related "technology forcing" effluent limits under the retained authority of § 510 of the Act. See *United States Steel Corp.* v. *Train,* 556 F.2d 822, 830 (7th Cir. 1977).

4. The states, municipalities and private individuals can seek the imposition of discharge limits necessary to protect water quality through federal or state common law and statutory remedies.

These remedies are not exclusive and can be pursued on a parallel basis. Such was the case with U.S. Steel Gary Works. The federal EPA and an Illinois state agency pursued water quality related control through the NPDES process. The Illinois Attorney General and the Metropolitan Sanitary District pursued stricter discharge limits by public nuisance actions or analogous nuisance oriented statutes under state law. In these cases, compliance with the most stringent standard imposed typically guarantees automatic compliance with the less stringent standards.

> "Although defendant argues that the agency proceedings are concerned with treatment of discharges, while the Attorney General seeks a recycle program to all but eliminate such discharges, defendant is not placed in the position of being unable to comply simultaneously with requirements of the NPDES permit and any

possible order of the circut court. If the circuit court should ultimately order abatement measures against U.S. Steel more stringent than those set by the NPDES permit, compliance with the state standard would, by defendant's own admission, satisfy the federal requirements."

People ex rel. Scott v. *United States Steel Corp., supra,* 352 N.E.2d at 229

Thus, it is the individually tailored pollution control requirement necessary to protect a given water body—in this case Lake Michigan—rather than the mechanical application of the national minimum discharge standard which must be developed. A common law nuisance trial or an action based on statutory prevention of a health hazard with full adversarial examination of conflicting positions is an excellent alternative means to establish such requirements.

II

Defendants Have Either Negligently Or Deliberately Misstated The Facts.

Plaintiff State of Illinois will highlight the major errors in defendants' citation of facts. Since the outline on pages 15-16 of defendants' memorandum does not follow the order of its citations to the record, plaintiff's reply will follow the points made in the text of defendants' memorandum, beginning at page 17.

1. Defendants' attempt to hide behind a make-weight distinction between conservative and non-conservative pollutants is pure hokum. (Def. Mem. pp. 17-25). This conservative versus non-conservative argument is another variant of the discredited claim in their reply brief that no witness testified that pollutants from Milwaukee, as opposed

to pure water, ever reached the state line (pp. 4-5 of defendants' joint reply brief).[12]

Having been exposed on the water versus pollutants argument, defendants now claim that, while Milwaukee pollutants may reach Illinois waters, the only ones that reach Illinois waters are "conservative" pollutants, not "non-conservative" pollutants (pollutants which degrade or die off) like bacteria and viruses. Defendants now claim that their experts were not talking about bacteria and viruses reaching Illinois, but simply about "conservative pollutants."

Defendants are dead wrong. Neither the trial court, nor plaintiff's witness Csanady, nor defendants' witnesses Pritchard and Carter based their conclusions on so-called "conservative" pollutants, as opposed to "non-conservative" bacteria and viruses. All of the experts followed what was essentially a multi-stage process of empirical analysis:

(a) Did the currents persist long enough and at sufficient speeds to transport effluent the 37 miles from the Milwaukee Harbor mouth to the Illinois line.[13]

(b) Recognizing that bacteria have growth and die-off characteristics, the experts used various "die-off" rates to calculate the number of bacteria surviving in Illinois

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[12] As plaintiff's supplemental memorandum (p. 60) sets forth, all the experts acknowledged that pollutants or effluents—as opposed to mere water—would reach the state line. Indeed, Carter's correspondence to defendants is replete with references to Milwaukee's effluent reaching the state line. In Defendants' Exhibit 905, Carter lists what are "Southerly flows sufficiently long and/or strong to transport *effluent from Milwaukee* to Illinois" (emphasis added). He states, "I conclude that spring is the most likely time for *Milwaukee effluent* to reach Illinois waters" (emphasis added).

[13] The frequency estimates of transport of 4 times (defendants) to 12 times (plaintiff)—all of which said the frequency could vary were based on 37 miles. Of necessity the lesser 25 mile distance from defendants' South Shore plant would involve greater frequencies.

> waters. The dispute was not whether there was so-called "die-off" of bacteria; the dispute was the degree of die-off and the resultant survival of bacteria in Illinois waters. Indeed, the whole thrust of Carter's testimony revolved around the transport and die-off of bacteria and the remaining bacteria in Illinois waters. (See Def. Ex. 1164, TR 8912-8932).

Nor was Pritchard dealing with "conservative" pollutants when he acknowledged the transport of substances discharged by Milwaukee. The colloquy between plaintiff's counsel and Pritchard at TR 7175-7176 deals with both "conservative" and "non-conservative" pollutants.

Carter and Pritchard, working as a firm called Hydrocon, had calculated that in 1973 there were four occasions when effluent from Milwaukee would have reached the state line, and the analysis was performed with respect to bacteria. (See Def. Ex. 905 and Def. Ex. 1064.) These four occasions involved analysis of only those situations where there were no interruptions or reversals in the southward flow of the current—so-called "single phase" excursions. The data analysis did not include situations where the current reversed direction temporarily and then after a time resumed a southerly flow.

As Pritchard explained at TR 7175, he did not look at such occasions because his analysis dealt with pollutants that die off, i.e. bacteria. At TR 7175-7176, Pritchard acknowledges that, if one were to deal with pollutants other than coliform bacteria—i.e., pollutants that do not die off (e.g., phosphorus)—one would want to look at those instances where there was a temporary reversal or interruption and where southerly flow than resumes. Pritchard acknowledged this difference between the four occasions of single-phase transport of bacteria and the more frequent transport of conservative pollutants at TR 7177:

> "Q. Doctor, with respect to a pollutant which isn't going to degrade, the time at which that pollutant or

> the number of times, number of excursions, that that pollutant would come down, under your experiments now, would be greater than the four times, isn't that right?
>
> "A. I would presume so, yes, sir."

Thus, we have a situation where defendants' own experts acknowledge movement of bacteria or pollutants subject to die-off on at least four separate single-phase transport excursions (Def. Ex. 905), and the likelihood of more frequent transport of non-degradable pollutants in current reversal situations.

The basic dispute between the experts was the rate of die-off of the bacterial pathogens.[14] Plaintiff's die-off evidence was based on the testimony of Edwin Geldreich, a nationally known bacteriologist, who testified that bacterial die-off for 90% removal ranges from four to eight days (TR 3085). Dr. Csanady used a die-off curve developed from several studies on survival of bacteria in Lake Michigan waters. These studies were referenced in one of defendants' expert's reports and that report stated:

> "Thus it is possible that it can take anywhere from 2 to 12 days for 90% of a coliform population to die off in Lake Michigan."
>
> Def. Ex. 85, p. 75

Defendants chose to ignore these test results and perform their own test. The test was performed by Mr. Carter who, while an undisputed expert in currents and transport, admitted to having no expertise in bacteriology (TR 8934).

The test methodology was severely criticized by Dr. Walter Mack, an eminent bacteriologist (TR 13480-13485).

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[14] Everyone acknowledges the much longer survival of viral pathogens.

Without going into great detail as to the test's technical deficiencies, Carter released bacteria on the bottom of the lake in 24 feet of water. Despite the release of the bacteria on the bottom in 24 feet of water, defendants chose to sample for bacteria in only the top three feet of water! Carter never measured the bacteria remaining in the remaining 21 feet of water depth! The trial court quite properly rejected defendants' "test" and instead relied on the testimony of Geldreich and on the other bacterial survival tests in Lake Michigan.

2. Defendants' list of reasons why pathogens will not survive to reach Illinois is specious. Defendants list four arguments why pathogens will not survive the transport to Illinois: alleged sedimentation, predation, biological inactivation, and ultraviolet radiation. A quick examination of these arguments discloses their inherent weaknesses.

Defendants would have this Court believe that these forces eagerly lie in wait in Lake Michigan to destroy the billions of viruses and bacteria discharged by Milwaukee. The evidence and common sense indicate otherwise.

(a) Sedimentation. Defendants would have this Court believe that sewage all settles in Milwaukee Harbor and never reaches Lake Michigan (Def. Mem. pp. 33-35), but hard evidence contradicts this claim. The Milwaukee Health Department takes daily tests of the water leaving the harbor at the various harbor openings. At the main harbor entrance those test results—after the water has passed through the harbor—show water with fecal coliform counts as high as 32,000 to 37,000 per 100 milliliters (Plaintiff's Exhibits 147, 148). Defendants' laboratory bacteriologists and Geldreich have stated that the test used by the City, the "MF" method, dramatically understates the fecal coliform count (Def. Ex. 204). Geldreich estimated that the numbers done by the more accurate "MPN" method would be 10 to 100 times higher (TR 3080). Plaintiff emphasizes that these tests are taken at the point where the water

leaves the harbor after all of the defendants' so-called "purification" takes place.

The highly contaminated flow from the harbor into Lake Michigan is further evidenced by defendants' water treatment plant records. These plant intakes sit in Lake Michigan, and the Howard intake sits about two and one-half miles out into the Lake in the path of the harbor discharges. Defendants' witness Zanoni wrote of the Howard plant:

> "Howard raw water much poorer quality than Linnwood Avenue. They get the flow from harbor and Jones Island treatment plant especially when bypassing. They use much more chlorine than Linnwood."
>
> Def. Ex. 201, TR 5474

In addition to the harbor discharges into the Lake, the South Shore Plant—which discharges directly into the Lake—has recorded fecal coliform discharges of 230 per 100 milliliters (MPN method) (Def. Ex. 96). So, despite, all the so-called claims of "purification" by sedimentation, enormous quantities of pathogens get into Lake Michigan.

Plaintiff also asks the Court to call on its own common sense. Of course, there are some sewage particles that will settle,[15] but much human fecal matter consists of light materials with a specific gravity close to that of water which will float along suspended in the water. As defendants' witness Katz testified as to why fecal material would not readily settle under quiescent conditions:

> "As fecal material, I would say that since it has a specific gravity close to water, that would be one of the last things that would deposit as a deposit. O.K ?"
>
> TR 11400

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[15] Plaintiff has previously pointed out the hazard of resuspension.

Defendants' witness Carter testified:

"Q. ". . . So lumps and debris can remain in suspension for a long period of time.

"A. If their density and size is such that they will, yes."

TR 8790

(b) Bacterial inactivation. The only evidence that defendants put in with respect to bacterial destruction of virus is the single laboratory experiment by Dr. Cliver with the water of Lake Wingra in Wisconsin. Cliver used special lab virus which, unlike virus in sewage, was not protected by solids.[16] On cross-examination, Cliver candidly acknowledged that he had no concrete or quantitative evidence on biological inactivation and that temperature could have had a major effect on the inactivation. Cliver stated:

"Q. Would you agree with me that you cannot say on the basis of quantitative measured evidence that the degree of, in your term, inactivation was caused by bacterial inactivation?

"A. I agree."

TR 10311

* * *

"I didn't quibble about the use of biological inactivation in this context, but let's just say that we supposed that loss of infectivity in that lake would be comparable to the rate of loss of infectivity in this lake. Whether it is biological or a temperature phenomena is immaterial.

"I don't know about sedimentation. I think there is reason to believe that there will be some inactivation.

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[16] The entire lab methodology of the Cliver experiment was critiqued by Dr. Mack (TR 13486-13487).

Whether it is biological or physical in nature at this point I think is of no great consequence.

"Q. Would it be fair to say that your position is that you are not certain whether it would be biological or temperature, that it could be one or both, but your opinion is that it would occur in Lake Michigan like it occurred in your lake sample in Defendants' Exhibit 38?

"A. Yes."

TR 10312

Cliver went on to say that, with the cold temperature of Lake Michigan, inactivation could take months to occur:

"THE COURT: Did I understand you correctly that during the winter months you believe that the inactivation of enteroviruses in the lake could take months to occur?

"THE WITNESS: That's correct."

TR 10315

Cliver also acknowledged that he had performed tests to see whether the bacteria in sewage inactivated virus, and he learned that sewage bacteria did not inactivate virus (TR 10327).

In short, the whole question of so-called bacterial inactivation of virus is conjectural at best. Moreover, the defendants' witness on this subject candidly acknowledged that viruses could survive for months in cold Lake Michigan waters.

(c) Bacterial predation. There is no quantitative or qualitative evidence of bacterial predation in Lake Michigan waters. Again, the plaintiff asks the Court to approach the evidence from a common-sense perspective.

In a desperate attempt to find some magic solution, defendants seek to shape the testimony of Dr. Otto, a fisheries biologist, into a major defense against pathogenic pollution. In so doing they mix apples and oranges of the animal life of the Lake. There is not dispute that bottom-dwelling organisms of a certain kind, i.e. oligochaetes (worms), will consume sewage particles. But Defendants' Exhibit 1321 shows that oligochaete worms are in significant abundance only in the Milwaukee Harbor. Further, Defendants' Exhibit 1321 only gives population of bottom organisms—so-called "macrobenthos." Defendants offered no evidence as to the quantities and species of zooplankton in the Lake. It is the zooplankton which are the organisms in the water column—not the macrobenthos (TR 10085). Moreover, as Dr. Otto pointed out, some zooplankton only eat plant life (phytoplankton); others only eat other zooplankton; and others are omnivorous (TR 10086). No evidence exists as to the species abundance or distribution of zooplankton in the Lake.

In fairness to Dr. Otto, defendants are trying to squeeze too much from his testimony. Otto testified primarily regarding the biological evidence of macrobenthos as it related to water quality.[17] He did not get into pathogenic removal.

Had Otto really testified as to predator removal of pathogens, he would have been cross-examined regarding his statements in Plaintiff's Exhibit 193, which was received in evidence without objection (TR 3726-3727) but stricken at the end of trial over plaintiff's objection.

Plaintiff's Exhibit 193 is Otto's report to defendants with regard to sewage effects on fish. In that exhibit, Otto points out that bacteria are not destroyed by predation, but may indeed infect the predator which can in turn infect

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[17] His testimony was rebutted by Dr. Alfred Beeton, who had supervised much of the benthic and eutrophication studies which have been done on Lake Michigan.

man. Thus, fish which consume bacteria may then become free swimming and independent sources of infection.

(d) Ultraviolet radiation. Nothing more need be said about the last excuse of the defendants—ultraviolet radiation—than to quote defendants' witness Cliver:

> "A. He asked me if there was any possibility that ultraviolet radiation would activate the virus, and I said yes. In the very superficial layer of water in the top there would be some of that.
>
> "Q. But you are not postulating that ultraviolet irradiation is going to have any significant effect on viruses within the water column, are you?
>
> "A. No."
>
> TR 10311

3. Defendants again raise the claim that the pollutants from Milwaukee would never get close to shore—beaches or water intakes. (Def. Mem. pp. 42-46.)

Both expert testimony and test data show that Milwaukee pollutants can and do move on shore. First, Milwaukee's health department records show that Milwaukee's fecal discharges move in and contaminate its own beaches (Def. Ex. 146-149). Second, dye studies by defendants' witness Kupfer show that the pollutant slug will stay offshore or move onshore in highly variable fashion (Pl. Ex. 221-223).

Defendants' witness Pritchard testified that, while his experiments showed a pollutant plume being transported directly to the beach (advection) only once, fecal contaminants could get to the beach by a process called lateral diffusion (TR 6564). Csanady testified:

> "Q. Are there situations that could occur where this peak concentration could move in on the shore?
>
> "A. Yes, and there would be situations where the slug meanders on shore and hits areas closer to shore."
>
> TR 2025

Edwin Geldreich of the Environmental Protection Agency testified:

> "A. I have had the opportunity to look at the bathing beach data from the Evanston-North Shore for the last ten years. Every year I get a summary of all the data, individual dates and all the data that has been collected on those dates during the bathing season.
>
> "At the same time the data is supplied to me on bacteriology, there is also supplied to me various weather conditions and notes about which way the wind is blowing and whether there has been storm periods and so on.
>
> "It is quite obvious that there are occasions when the kind, when it is blowing from the northeast, is pushing pollution on those beaches."
>
> TR 3111

Further, there is evidence of fecal contamination on Illinois beaches. There are repeated violations of Illinois standards for fecal coliform at Lake County beaches (Pl. Ex. 172, 173). Furthermore, defendants have misstated Illinois' fecal standards. The Illinois Pollution Control Board has set a standard of *20* fecal coliform (geometric mean), not 200 as stated by defendants (IPCB Rule 206(d), Lake Michigan). The Illinois Department of Health prohibits any two consecutive single fecal test results over 100 per 100 milliliters. The Lake County beach records show repeated violations of these standards.

4. The defendants' arguments that additional tests should be performed is a red herring. Of course, some additional testing can always be performed, but the lack of additional tests does not obviate the overwhelming mass of evidence already in the record. The defendants want scientific evidence beyond a shadow of a doubt, but such certainty is neither possible nor necessary. The proper ap-

proach to the scientific evidence in public health cases was articulated by Judge Wright in *Ethyl Corp.* v. *EPA*, 541 F.2d 1 (D.C. Cir. 1976):

> "Petitioners demand sole reliance on *scientific* facts, on evidence that reputable scientific techniques certify as certain. Typically, a scientist will not so certify evidence unless the probability of error, by standard statistical measurement, is less than 5%. That is, scientific fact is at least 95% certain.
>
> "Such certainty has never characterized the judicial or the administrative process. It may be that the 'beyond a reasonable doubt' standard of criminal law demands 95% certainty. *Cf. McGill* v. *United States*, 121 U.S.App.D.C. 179, 185 n.6, 348 F.2d 791, 797 n.6 (1965). But the standard of ordinary civil litigation, a preponderance of the evidence, demands only 51% certainty. A jury may weigh conflicting evidence and certify as adjudicative (although not scientific) fact that which is believes is more likely than not. Since *Reserve Mining* was adjudicated in court, this standard applied to the court's fact-finding. Inherently, such a standard is flexible; inherently, it allows the fact-finder to assess risks, to measure probabilities, to make subjective judgments. Nonetheless, the ultimate finding will be treated, at law, as fact and will be affirmed if based on substantial evidence, or, if made by a judge, not clearly erroneous."
>
> 541 F.2d 1, 28 n.58 (emphasis in original)
>
> "Even scientific 'facts' are not certain, but only theories with high probabilities of validity. Scientists typicaly speak not of certainty, but of probability; they are trained to act on probabilities that statistically constitute 'certainties.' *See generally* T. Kuhn, The Structure of Scientific Revolutions. While awaiting such statistical certainty may constitute the typical mode of scientific behavior, its appropriateness is

questionable in environmental medicine, where regulators seek to prevent harm that often cannot be labeled 'certain' until after it occurs. *See* note 58 *infra.*

"The uncertainty of scientific fact parallels the uncertainty of all fact. In a metaphysical sense, at least, facts are themselves nothing more than risks, or statistical probabilities. *See* D. Hume, A Treatise of Human Nature, bk. 1, pt. III, § 6, at 87 (L.A. Selby-Bigge ed. 1958)."

Id., at 25 n. 52

Perhaps the most egregious dissembling by defendants comes in the area of disease in Illinois caused by enteric (fecal) pathogens. Defendants repeatedly suggest that there was no evidence of enteric disease in Illinois (Def. Mem., p. 16). The record, however, is absolutely clear that Illinois residents are being infected and are suffering from enteric diseases caused by fecal transmission (TR 2217, 13228; Def. Ex. 83).

What cannot be established is the epidemiological link between transmission of the fecal contamination by water or some other route. Contrary to the statements by Dr. Cliver, who was a research virologist and not an epidemiologist, Dr. Wellings and Dr. Melnick testified at length about the epidemiological difficulty of tracking down the source of the virus. (See generally the testimony of Dr. Wellings, TR 13183-13242.) [18]

5. The defendants' critique of the trial judge's order as not being "cost-effective" is spurious. Defendants use the

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[18] And see Plaintiff's Exhibit 236, which was prepared under the supervision of defendants' witness Sproul:

"The true incidence of waterborne disease is very difficult to estimate. Epidemiological techniques are not sensitive enough to detect a low level of transmission by the water route." (p. 14).

term "cost-effective" without ever giving meaning to it. "Cost-effective" is little more than a word game. "Cost-effectiveness" purports to measure the cost of the treatment against the benefit to be obtained. Fundamental to such an analysis is a detailed knowledge of the costs and the benefits.

Interestingly, defendants have never provided the back-up for their cost estimate nor any basis for disputing Gordon Culp's estimate of 59 million dollars, or approximately $2.00 per month per household, for advanced waste treatment. Defendants' witness Zanoni, quoted at length at pp. 71-80 of defendants' memorandum, had no knowledge of costs. His 253 million dollar cost claim was prepared by the defendants' witness Gupta, who was unable to substantiate his cost claims. Indeed, the only source Gupta quoted was a book by Culp and Culp on advanced treatment. Plaintiff then called Gordon Culp, who did an extensive cost analysis to support his 59 million dollar estimate.

The second element of cost-effective measurement is what benefit will be obtained. Such an analysis presumes that a numerical value can be placed on keeping Lake Michigan in a non-degraded state, but defendants admit that a dollar value cannot be placed on the preservation of Lake Michigan:

> "Q. Dr. Katz, can you give a dollar value to the benefit society receives from maintaining Lake Michigan in a non-degraded or undegraded state?
>
> "A. That society receives?
>
> "Q. Yes.
>
> "A. I can't do that, no."
>
> TR 11469

Defendants place most of their cost-effective emphasis on the witness Sproul's opinion that the existing plants

removed 99% of the viruses (Def. Mem., p. 65). They seek to negate the testimony of Dr. Berg and Dr. Wellings that secondary activated sludge plants have spotty virus removal by attacking the methods they use to test sewage. Drs. Berg and Wellings stand in the record as having performed hundreds to thousands of tests on sewage as to influent, primary effluent, secondary effluent and—in Dr. Wellings' case—advanced waste treatment effluent. Defendants, having in pre-trial period classified Dr. Wellings as "indeed an authority on sewage and water-borne viruses," [19] now seek to denigrate her vast testing experience and that of Dr. Berg, a top EPA expert on virus.

Drs. Berg and Wellings testified that, when they found high numbers of solids in activated sludge plant effluent, they found high numbers of viruses. Wellings based her opinion as to the low viral removal efficiency of defendants' plants on the poor solids removal by the plants. On many days there are as many fecal solids leaving the plants as coming in.

Dr. Sproul gave his contrary opinion about viral removal efficiency based on the same operating records of defendants' plants as Dr. Wellings. Only, unlike Dr. Wellings or Dr. Berg, Sproul has never tested any sewage from any sewage plant at any stage for enteric virus:

> "Q. Let's talk about for [*sic*] enteric viruses. You have never tested waste water to determine either the numbers of viruses or the distributive pattern of viruses within that wastewater?
>
> "A. What do you mean by distributive patterns?
>
> "Q. Whether they are evenly dispersed, clumped, or anything else.
>
> "A. That is correct."
>
> TR 10625, 10626

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[19] Plaintiff's Exhibit 117. Indeed, plaintiff learned of Dr. Wellings' expertise through this memo by defendants' plant manager.

Indeed, Sproul published an article contained in Plaintiff's Exhibit 140 which contradicts his court opinion of high viral removal by defendants' plants:

> "Plant scale data for virus removal by the activated sludge process are spotty and often show removals *lower than those in laboratory studies.* . . . Chlorine is an effective virucide in water under proper conditions. For best results, chlorine should be present as hypochlorous acid, and *no suspended solids or turbidity should be present.*"
>
> Pl. Ex. 140, p. 173 (emphasis added)
>
> "These data indicate that for the viruses shown in the table, free chlorine residuals of 1 to 2 mg/l with contact times of 1 to 2 hr would be required for extensive inactivation in waters with pH values of about 7.8."
>
> *Id.*, p. 174
>
> "Most disinfection standards for wastewater treatment plants can be met with combined chlorine residuals; under these standards, it is obvious that *little virus inactivation is obtained.*"
>
> *Id.*, p. 175 (emphasis added)

Sproul's entire court opinion was based on other reported lab studies. As emphasized repeatedly, defendants' discharges are high in solids; a 30/30 standard would allow daily discharges of 100 or more mg/l solids. Defendants' plants now operate to maintain a combined, not a free, chlorine residual. Defendants' plant records show a consistent zero reading on free chlorine by the amperometric method.[20]

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[20] The amperometric method is the more accurate method for measuring free chlorine and is relied upon in preference to the less reliable orthotolodine method (TR 12121-12123).

Finally, defendants cite two EPA studies purporting to show that viruses will not get through water treatment plants (Def. Ex. 3, 34). However, EPA expert Berg testified that the crude viral detection methodology used in those studies gave no assurance that the plants were removing all virus (TR 12077-12083). Berg expressed concern about the solids that got through the water treatment plant in those tests (TR 12081). The authors of Defendants' Exhibit 34 did not bother to test the solids for virus, even though Wellings and others have pointed out that solids are repositories of virus (TR 13264-13265).

6. Defendants again try to argue that Illinois allows more lenient discharge standards for its dischargers. As emphasized, this is not true on Lake Michigan. Moreover, it is not true in the rest of Illinois either. The numerical limits set by Illinois regulations are essentially minimum effluent technology numbers similar to the 30/30 standards [21] set nationally by the EPA. As the national scheme provides, tougher limits may be imposed by *ad hoc* administrative or judicial action where necessary to protect water quality.

Defendants completely ignore Rule 402 which provides for the imposition of these tougher standards:

> "In addition to the other requirements of this Part, no effluent shall, alone or in combination with other sources, cause a violation of any applicable water quality standard. When the Agency finds that a discharge that would comply with effluent standards contained in this Chapter would cause or is causing a violation of water quality standards, the Agency shall take appropriate action under Section 31 or Section 39 of the Act to require the discharge to meet what-

---

[21] Defendants attempt to suggest that 30/30 and 5/5 are not really that different. But as the record emphasizes, 5/5 means consistent pathogen destruction; 30/30 is a license to spew billions of pathogens on any given day.

ever effluent limits are necessary to ensure compliance with the water quality standards." [22]

These tougher "water quality related" effluent standards may be imposed by administrative action by the state agency. Alternatively, similar more stringent standards may be imposed by nuisance-type actions brought by the Attorney General. As noted above, the state legislature has expressly given the Attorney General power to seek judicial relief stronger than and independent of requirements of either the State Pollution Control Board or the State Environmental Protection Agency. This independent judicial remedy has been used many times to impose tougher requirements than those required by the administrative agencies.

As stated to the Court, the Attorney General's office is not aware of any direct body contact recreation or water supply use of any water in the State of Illinois where less stringent effluent standards apply. For example, to our knowledge, the Illinois River is not used for either direct body contact recreation or water supply.

If such use were initiated and the Attorney General's office learned that sewage effluent was being discharged so as to bring bacterial and viral pathogens into potential contact with either a public water supply or swimming location, this office would initiate a nuisance action to impose standards of equal stringency to those imposed by the District Court below.

Indeed, as to the solitary once-a-year discharge of Waukegan, the Attorney General is willing to bind the State of Illinois to eliminate that discharge even though the District Court referred to it as *de minimis* next to Milwaukee's.

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[22] Water quality standards include freedom from substances harmful to human health (Rule 203).

Conclusion

For almost fifteen years the Milwaukee defendants have been in administrative and judicial proceedings to presumably clean up their gross pollution of Lake Michigan. For all the legalese bandied about, the fecal pollution of Lake Michigan is greater today than when the proceedings started. Milwaukee had its day—indeed, its months—in court in a scrupulously fair and exhaustive proceeding.

Milwaukee's brief ignored the fact that its own consultant recommended the treatment ordered by the District Court and that other Lake Michigan dischargers (e.g., Gary, East Chicago, Hammond) are being required to meet identical limits. For the sake of Lake Michigan, let the plethora of legal briefs be replaced by a decision of this Court affirming construction of the facilities ordered by the District Court.

Respectfully submitted,

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Attorney General of the
State of Illinois

By /s/ JOSEPH V. KARAGANIS
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Joint Memorandum of Defendants-Appellants City of Milwaukee, The Sewerage Commission of the City of Milwaukee and The Metropolitan Sewerage Commission of the County of Milwaukee to the United States Court of Appeals for the Seventh Circuit

IN THE UNITED STATES COURT OF APPEALS
FOR THE SEVENTH CIRCUIT

No. 77-2246

PEOPLE OF THE STATE OF ILLINOIS, *Plaintiff-Appellee,*

and

PEOPLE OF THE STATE OF MICHIGAN,
Intervening Plaintiff-Appellee,

vs.

CITY OF MILWAUKEE, THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE, and THE METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE,
Defendants-Appellants.

Appeal of the United States District Court for the Northern District of Illinois, Eastern Division
Honorable John F. Grady, Presiding

JOINT MEMORANDUM OF DEFENDANTS-APPELLANTS CITY OF MILWAUKEE, THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE and THE METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE

Defendants in all respects reaffirm the statements made and the positions taken in prior submissions to this Court. A lack of response to any particular comment or accusation by Illinois should under no circumstances be taken as agreement, admission or assent thereto. We suggest that the following points remain unanswered by Illinois and are dispositive.

PREVIOUS PAGE WAS BLANK

The *sine qua non* of the judgment before this court on appeal is an action arising under the laws of the United States. 28 U.S.C. § 1331. Without it, neither this court nor the court below has jurisdiction. THIS IS NOT A DIVERSITY CASE AND JURISDICTION CANNOT BE GROUNDED ON THAT BASE!

The *federal* common law of nuisance used by Justice Douglas as the basis of the decision in *Illinois* v. *Milwaukee* that an action alleging interstate pollution arises under the "laws of the United States" was a choice of law preventing resort to state law in this federal form; it is the *federal* common law of nuisance that served as the jurisdictional underpinning. The lower *federal courts* have no jurisdiction to hear cases seeking to abate interstate pollution on the basis of state law.

This court's order of May 28, 1978 directed the appellees to set forth the elements required to be proved to establish a unisance under the *federal* common law. The appellees' original memorandum filed in response to this court's order totally failed to discuss the *federal* common law of nuisance. Instead, it discussed general nuisance concepts under various state and English common law decisions and authorities. In the responsive memorandum filed by appellants, we pointed out this failure by appellees to deal with that central jurisdictional issue. Appellees have now filed a second responsive memorandum which demonstrates that this failure is beyond remedy. The appellees are unmasked. The *federal* common law does not support, and cannot be molded to support, the judgment below.

The bypassing of the jurisdictional issue is most clearly reflected where the appellees' second memorandum states:

> "It makes little difference to the question of liability and remedy for this case to be decided under the aegis of federal common law, *state* common law or *state* statute." (Illinois Memorandum, p. 9, emphasis supplied)

But, there is a difference, and this difference goes to the heart of the authority of lower federal courts to hear and decide interstate pollution claims. Unless the liability and remedy found and imposed by the judgment below is based upon the *federal* common law of nuisance, the choice of law applicable to this case, this court and the district court have no jurisdiction, and, lacking jurisdiction, the judgment must be reversed.

No "rationale" or argument offered by the appellees (see Illinois Memorandum, p. 9) can supply the missing condition to the validity of the judgment below. This action can only be entertained if it is an action arising under the laws of the United States.

Finally, nowhere does Illinois meet the fact pointed out by appellants that, as in the Supreme Court cases of *Missouri* v. *Illinois,* 200 U.S. 496 (1905); *New York* v. *New Jersey,* 256 U.S. 296 (1921); and *North Dakota* v. *Minnesota,* 263 U.S. 344 (1923), the evidence here adduced by plaintiff consists principally of speculations by experts, which was met by counter opinions of equally impressive experts produced by defendants. The evidence of plaintiffs was not actual data from tests of the waters involved even though such tests could have been made by plaintiffs and such tests as were made were made by defendants and were negative. The Supreme Court cases stand for the principle that a state may not utilize the federal common law of nuisance to impose its will upon the citizens of another state absent hard evidence in these circumstances.

Among others discussed in our previous briefs and memorandum there are two fundamental reasons in this case for concluding that a federal common law nuisance has not been established. First, Illinois imposes less stringent discharge standards upon discharges to its own waters than the lower court has required of defendants in this case. Illinois does not return to its "nitrification" explanation at

oral argument which was shown to be without record or factual foundation, rather, Illinois now claims that it is unaware of any use of the water its regulations define as "primary contact waters" for body contact recreation or water supply, except where its applicable discharge standards require effluent to meet the same standards imposed by the lower court. Thus, Illinois would bypass the fact that pertinent Illinois regulations expressly permit the discharge of effluent which does not meet the same standards imposed upon appellants, where such discharges will be made to waters which may be used for primary contact. But Illinois' position is even more egregious! Illinois knows that its regulations *nowhere* impose a 5/5 with a 10/12 daily maximum limit; its regulations *nowhere* require a free chlorine residual; and, its regulations *nowhere* impose a 40 fecal coliform effluent limitation. *All* these effluent limitations are imposed on defendants. In fact, Illinois permits a continuous effluent discharge of *400* fecal coliforms per 100 milliliters. (Pl. Ex. 171 Part IV Effluent Standards § 405). In the same fashion Illinois bypasses the fact that its regulations allow 200 fecal coliform as a *water quality* level in water designated as "primary contact waters." (Pl. Ex. 171 Part II Water Quality Standard § 203(g)). Illinois' deceptive citation of a 20 fecal coliform (geometric mean) standard applicable only to Lake Michigan should not mislead this Court from the fact that primary contact such as bathing is permitted in Illinois' waters with a fecal coliform content of 200 per 100 milliliters (geometric mean) notwthstanding an uncited 100 per 100 milliliter figure not in the record. (Ill. Memorandum p. 26).

Illinois cannot be heard to argue in this context that if it ever finds someone swimming in its waters it will do something about it. We note that Illinois does not even tell us whether it intends to enjoin the swimmer or clean up the effluent.

The second fundamental reason for following the pattern set by the Supreme Court in ordering dismissal is the fact that in addition to a similar evidentiary record being present, here Congress has established a forum with expertise and the power to meet these questions on a discharge by discharge basis. Illinois has ignored the forum of the experts in favor of going to the self-admittedly inexpert district court. The case should be dismissed with the option open to the state to intervene in the permit process still, and most appropriately, available to plaintiffs. The federal courts following the example of the Supreme Court should avoid acting in these areas calling for scientific expertise without the clearest of proof.

Reversal, leaving the opportunity to pursue the administrative route of expertise would permit plaintiffs the advantage of the holding of *Ethyl Corp.* v. *Environmental Protection Agency,* 541 F.2d 1 (D.C. Cir. 1976). That is the case whose footnotes are quoted extensively at pages 27 and 28 of the Illinois brief. It is also a case which deals with the determination of scientific facts by an expert administrative tribunal and states in the *body* of the opinion at page 28 of 541 F.2d on the subject matter of the footnotes quoted by Illinois:

> "Where a statute is precautionary in nature, the evidence difficult to come by, uncertain, or conflicting because it is on the frontiers of scientific knowledge, the regulations designed to protect the public health, *and the decision that of an expert administrator,* we will not demand rigorous step-by-step proof of cause and effect. (emphasis supplied)

We reiterate that the subject matter of this case is best placed before the expert tribunal created by Congress to deal with the scientific questions presented. Certainly this is most appropriate where the trier of fact has expressly stated a lack of expertise in the scientific areas considered.

Respectfully submitted,

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Amended Judgment Order of the United States District Court for the Northern District of Illinois

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

Case No. 72 C 1253

PEOPLE OF THE STATE OF ILLINOIS, ex rel. WILLIAM J. SCOTT, Attorney General of the State of Illinois, *Plaintiff*,

and

PEOPLE OF THE STATE OF MICHIGAN, *Intervening Plaintiff*,

v.

CITY OF MILWAUKEE, WISCONSIN; CITY OF KENOSHA, WISCONSIN; CITY OF RACINE, WISCONSIN; CITY OF SOUTH MILWAUKEE, WISCONSIN; THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE, and THE METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE, *Defendants.*

AMENDED JUDGMENT ORDER

This Court's Judgment Order dated November 15, 1977 having been affirmed in part and reversed in part by the United States Court of Appeals for the Seventh Circuit, on April 26, 1979, under that Court's docket number 77-2246, and the case having been remanded to the Court for appropriate action in conformity with the Seventh Circuit Opinion, as herein set forth,

NOW THEREFORE, IT IS HEREBY ORDERED, ADJUDGED AND DECREED that the defendants CITY OF MILWAUKEE AND THE METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE and each of them and their agents, employees or successors in interest are hereby permanently enjoined from emitting sewage discharges, from the respective sewer pipes or structures owned or maintained by the defendants,

into Lake Michigan or any of its tributary waters, except as hereinafter permitted in this order and said defendants are hereby ordered to:

(1) The respective defendants shall in their respective jurisdictions eliminate all sewage overflows emanating from sewer piper or structures owned, operated or maintained by the defendants located outside of the area which was designed by the defendants at trial as the Combined Sewer System Area hereinafter ("CSO"). Elimination of such overflows shall be completed on or before July 1, 1986. For purposes of this order, an overflow is defined as a crossover, bypass, diversion structure, relief structure, pump station or any other device or mechanism by which human fecal waste is discharged directly or indirectly to public streams, rivers or lakes without collection and treatment according to the treatment methods and effluent limits set forth in paragraph (3) below. If, in defendants' opinion, completion by such date becomes impossible due to circumstances beyond defendants' control, then defendant(s) may apply to the Court for an extension of time for completion. Any such application, if opposed by either plaintiff, must be predicated on an evidentiary hearing preceded by adequate opportunity for discovery by plaintiffs. Defendant shall be required to prove the basis for and for necessity for such extension which extension shall be granted or denied in the sound discretion of the Court. Defendants shall pay plaintiff(s)' entire costs of any such application including reasonable attorneys' and experts' fees, and the costs of discovery, preparation and presentation of their position.

(2) The Commission defendants shall in three stages, the first to be completed on or before December 31, 1985; the second on or before December 31, 1987; and the third on or before December 31, 1989, put into

operation a collection, and conveyance system in the combined sewer system area ("CSO") which shall collect and convey all human fecal waste entering the sewers in the combined sewer system area. The first stage of such system shall have storage capacity of not less than 700 acre feet, the second not less than an additional 1290 acre feet, and at the completion of the third stage (December 31, 1989) the entire system shall have storage capacity of not less than 2605 acre feet and shall be designed and operated within such storage capacity so as to collect, convey and store the volume of flow and all human fecal waste capable of transmission by the combined sewer system. Defendants have analyzed rainfall events experienced during the period 1940 through the date hereof (which is the period for which detailed hourly rainfall data is available) and have represented to this Court that their analysis demonstrates that at a storage capacity of 2605 acre feet, there would have been no overflows from such a system. All fecal wastes and flows collected and conveyed from the combined sewer area shall be treated according to the treatment methods and to the effluent limits set forth in paragraph (3) below.

Overflows, if any, which do occur shall constitute a violation of this order unless defendants can prove as a defense to a charge of violation either:

(1) that the overflow resulted from runoff conditons which exceeded the capacity of the 2605 acre feet of storage at a pump out rate to the treatment required by this Judgment Order of 110 CFS; and that the runoff events which resulted in the overflow would have caused an overflow in excess of the design capacity of the 2605 acre feet storage system at 110 CFS under the identical scientific premises and caluculations used by the defendants prior to the date of this order to design the size of such storage system; or in

the case of overflows resulting from causes other than excess runoff events,

(2) that the overflow was wholly caused by actions or occurrences wholly outside the control of the defendants and was in no way caused or contributed to by the negligence of the defendants.

Any defense to an overflow violation shall be predicated on an evidentiary hearing preceded by an adequate opportunity for discovery by plaintiffs. Defendants shall bear the evidentiary burden of proof of establishing the defenses listed above, and if the Court finds that the defense has not been proven, shall pay plaintiff(s)' entire costs of opposing any such defense including reasonable attorneys' and experts' fees and the costs of discovery, preparation, and presentation of plaintiffs' position. In any event, any overflows which may conceivably occur shall be subjected to treatment by bar screens, followed by drum screens, followed by chlorination prior to discharge. Should defendants develop information which establishes in defendants' opinion that separation of all or part of the system is a preferred alternative, which will provide a collection and treatment level equal to or better than that required herein then defendants may apply to the Court for modification of this paragraph to provide therefor. Any such modification, if opposed by either plaintiff, must be predicated on an evidentiary hearing preceded by adequate opportunity for discovery by plaintiffs. Defendants shall bear the evidentiary burden of proof of establishing that such modification equals or exceeds the level of protection provided herein. Defendants shall pay plaintiff(s)' entire costs of any such application including reasonable attorneys' and experts' fees, and the cost of dis-

covery, preparation and presentation of their position.

(3) The Commission defendants or their successors in interest shall from and after December 31, 1985 treat all human fecal wastes which reach existing, expanded, or newly constructed treatment plants owned, operated, or maintained by the defendants by means of appropriate secondary treatment facilities which facilities shall as of December 31, 1986 and thereafter produce an effluent which does not exceed thirty (30) milligrams per liter (mg/l) suspended solids and thirty (30) milligrams per liter of five (5)-day carbonaceous biochemical oxygen demand (BOD_5). From and after December 31, 1986, there shall be no by-pass at any existing, expanded or newly constructed treatment plant.

The effluent requirements for suspended solids and BOD_5 shall be calculated on the basis of the arithmetic mean of daily composite samples collected in a period of 30 consecutive days, provided that the arithmetic mean of the values for effluent samples collected in a period of 7 consecutive days shall not exceed 45 milligrams per liter; and provided further that the monthly average shall not exceed 15% of the average carbonaceous BOD_5 or suspended solids influent during the same period.

Fecal coliform counts in the effluent shall not exceed 200 per 100 milliliters as a smoothly geometric means and shall not exceed 400 per 100 milliliters as a weekly geometric mean. Fecal coliform requirements shall be calculated on the basis of twice weekly grab samples.

Phosphorus (P) concentrations shall be no more than one (1) milligram per liter based on a monthly average.

Defendants shall monitor both total residual chlorine and available free chlorine in the effluent.

(4)Plaintiffs have emphasized their concern to maintain a detailed understanding of defendants' progress in designing and constructing the facilities ordered by the Court. Defendants have agreed to and shall allow plaintiffs, during working hours and upon reasonable notice, to conduct a continuing engineering audit of defendants' progress in complying with this order and have agreed to permit plaintiffs (and persons designated by plaintiffs) complete access to all planning, testing, design and construction or operational work or materials prepared by defendants or their consultants. Defendants have also agreed to and shall promptly pay the reasonable charges or fees of persons designated by plaintiffs to conduct such continuing engineering audit provided that such engineering audit activities to be paid by defendants shall not exceed 50 man days per calendar year; and any of such required payments accrued or made during the course of appeal shall be and remain the obligation of defendants regardless of the outcome of any appeal.

(5) During the periods necessary to complete the facilities required for compliance with the provisions of this order, as set forth above, the defendants shall be permitted, on the basis of using the best engineering practices available within the limits of the capabilities of those facilities, to continue the operations of their respective sewage collection, treatment and discharge facilities as the same may be modified from time to time to comply with the requirements of this order. Existing disinfectant systems shall be maintained and operated in such periods and no new by-passes or

overflows shall be installed or operated during such periods except that prior to December 31, 1986 *and not thereafter* a by-pass may be installed and operated if required as a protective device to protect the South Shore Plant and then only if triggered at and operated during the existence of a flow rate equal to or greater than the plant flow capacity (260 to 316 mgd) for flow in excess of such capacity. In the event that plaintiff(s) challenge any overflow as being in violation of the provisions of this order for the reason that such overflow was not triggered by and limited to flows in excess of plant capacity, it shall be the burden of the defendants to prove in an evidentiary hearing preceded by adequate discovery by plaintiff(s) that such overflow was triggered by and limited to flows in excess of plant capacity. If the Court finds that the defense has not been proven, defendant(s) shall pay plaintiff(s)' entire costs of opposing any such defense including reasonable attorneys' and experts' fees and the costs of discovery, preparation and presentation of plaintiffs' position.

As set forth in paragraph (3) above, all by-passes shall be eliminated by December 31, 1986. If one or more additional temporary overflows become necessary in defendants' opinion in the defendant City of Milwaukee's system for operation to protect the public health prior to December 31, 1986, then defendants may apply to the Court for a modification of this paragraph 5 to permit operation of such additional overflows up to but not after December 31, 1986. All such overflows shall be eliminated by December 31, 1986. Any such modification, if opposed by plaintiffs, must be predicated on an evidentiary hearing preceded by adequate opportunity for discovery by plain-

tiff(s). Defendants shall bear the evidentiary burden of proof establishing the public requirements for such modification which shall be founded in such public health requirements as, but not limited only to, preventing the backing-up of sewage in basements. Defendants shall pay plaintiff(s)' entire costs of any such application including reasonable attorneys' and experts' fees and the costs of discovery, preparation and presentation of their position. Nothing herein shall relieve defendants or any of them from compliance with other applicable discharge standards.

(6) As a joint and several responsibility, defendants shall pay immediately to plaintiffs the amount of $230,000.00, in the manner directed by plaintiffs, as costs of these proceedings, in lieu of following normal procedures to tax costs by the Clerk of this Court. Such sum in total shall be returned to defendants in the event judgment is reversed in toto; in no event shall defendants question the individual items or dollar amounts within such total.

(7) All burdens of proof set forth as requirements of this Amended Judgment Order shall be met by a standard of preponderance of the evidence.

(8) The Court hereby approves and orders the defendants to adhere to the schedules set forth in Exhibits 1 and 2 attached to the original Judgment Order in this cause for compliance with this Amended Judgment Order, excepting only the references therein to advance waste treatment. If defendants apply to the Court for modification of any component of the time schedules ordered herein, such modification, if opposed by plaintiffs or

either of them, must be predicated on an evidentiary hearing preceded by adequate opportunity for discovery by plaintiffs. Defendants shall bear the burden of proof that such modification is required by causes wholly outside the control of the defendants or their agents, consultants or employees, and was in no way caused or contributed to by the negligence o fthe defendants or their agents, consultants or employees. The granting or denial of any such application shall be in the sound discretion of the Court.

(9) The Court hereby expressly reserves jurisdiction over the parties hereto and over the subject matter hereof to enforce the provisions of this Amended Judgment Order.

Entered: January 31, 1980

/s/ JOHN F. GRADY
John F. Grady
United States District Judge

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

Case No. 72 C 1253

PEOPLE OF THE STATE OF ILLINOIS, ex rel. WILLIAM J. SCOTT, Attorney General of the State of Illinois, *Plaintiff*,

and

PEOPLE OF THE STATE OF MICHIGAN, *Intervening Plaintiff*,

v.

CITY OF MILWAUKEE, WISCONSIN; CITY OF KENOSHA, WISCONSIN; CITY OF RACINE, WISCONSIN; CITY OF SOUTH MILWAUKEE, WISCONSIN; THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE, and THE METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE, *Defendants.*

SUPPLEMENT #1 TO THE JUDGMENT ORDER

WHEREAS, one of the provisions of the Judgment Order herein relating to the Combined Sewer System area (CSO) is: "Should def ıdants develop information which establishes in defendants' opinion that separation of all or part of the system is a preferred alternative, which will provide a collection and treatment level equal to or better than that required herein, then defendants may apply to the Court for modification of this paragraph to provide therefor."; and,

WHEREAS, proceedings herein are not now stayed and the parties expressly agree that proceeding to secure the modification of the Judgment Order reflected herein is without

prejudice to the positions of the parties in respect of objections they have heretofore made herein or any appellate procedures now being or hereafter pursued by the parties or any of them; and

WHEREAS, the respective defendants have represented to the Court that in defendants' opinion it is the preferred alternative to totally eliminate overflows from certain portions of the CSO by means of storm sewer/sanitary sewer separation rather than to build a conveyance, storage and treatment system in those portions of the CSO; and

WHEREAS, the respective defendants have represented that the certain portions of the CSO, where such separation is the preferred alternative to a convey, store and treat system, represent approximately 8% of the CSO and that these portions are identified on the attached map (Appendix A to this Supplement No. 1 to the Judgment Order);

NOW, THEREFORE, upon the subjoined stipulation of the parties, it is hereby ordered, adjudged and decreed that:

From this date forward defendants shall separate the sewer system in the portion of the Combined Sewer System Area (CSO) marked on Appendix A and upon separation such separated system shall be subject to the exact same requirement of the Judgment Order regarding sewage collection and elimination of overflows as all other areas covered by the Judgment Order which are outside the combined sewer system area.

Dated this 31 day of January, 1980.

/s/ JOHN F. GRADY

The foregoing order is hereby stipulated and agreed to and may be entered upon application of defendants as Supplement No. 1 to the Judgment Order herein without further notice.

PEOPLE OF THE STATE OF ILLINOIS

By /s/ WILLIAM J. SCOTT by
JOSEPH V. KARAGANIS

PEOPLE OF THE STATE OF MICHIGAN

By /s/ THOMAS J. EMORY for
FRANK T. KELLEY
Attorney General

THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE AND THE METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE

By /s/ EDWIN J. ZARWELL
Its Attorney

CITY OF MILWAUKEE

By /s/ GRANT F. LANGLEY
Asst. City Atty.

Order of the Supreme Court of the United States
(Mr. Justice Stevens)

SUPREME COURT OF THE UNITED STATES

No. A-918 (79-408)

CITY OF MILWAUKEE, ET AI
Petitioners,

v.

ILLINOIS, ET AL.

ORDER

UPON CONSIDERATION of the application of counsel for the petitioners, the response filed by the State of Illinois and the reply thereto,

IT IS ORDERED that all judgments, decrees and orders entered by the United States Court of Appeals for the Seventh Circuit, Case No. 77-2246, and the United States District Court for the Northern District of Illinois in the above-entitled case be, and the same are hereby, stayed pending the sending down of the judgment of this Court.

/s/ JOHN PAUL STEVENS
Associate Justice of the Supreme
Court of the United States

Dated this 8 day of May, 1980

A true copy MICHAEL RODAK, JR.
Test:

Clerk of the Supreme Court of the United States
By /s/ FRANCIS J. LORSON
Deputy

Plaintiff's Exhibit 62 (relevant portions)

Permit No. WI-0024767
Application No. WI-0024767

PERMIT TO DISCHARGE UNDER THE WISCONSIN POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of Chapter 147, Wisconsin Statutes,

THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE

is permitted to discharge from a facility located at

700 EAST JONES STREET, MILWAUKEE (JONES ISLAND PLANT)

to LAKE MICHIGAN

in accordance with the effluent limitations, monitoring requirements and other conditions set forth in Parts I and II hereof.

This permit shall become effective on the date of signature.

This permit to discharge shall expire at midnight, June 30, 1977.

Permittee shall not discharge after the date of expiration. If the permittee wishes to continue to discharge after this expiration date he shall file an application for reissuance of his permit in accordance with the requirements of Chapter NR 200, Wisconsin Administrative Code, at least 180 days prior to this expiration date.

State of Wisconsin Department of Natural Resources
For the Secretary

By /s/ OLIVER D. WILLIAMS
Oliver D. Williams
Acting Administrator
Division of Environmental Standards

Dated this 27th day of December, 1974

PREVIOUS PAGE WAS BLANK

SPECIAL CONDITIONS

A. Effluent Limitations and Monitoring Requirements

(1) During the period beginning on the effective date of the permit and lasting until June 30, 1977 the permittee is authorized to discharge from outfall serial number 001 (treatment plant outfall).

(2) This discharge shall be limited and monitored by the permittee as specified below.

(a) There shall be no discharge of floating solids or visible foam in other than trace amounts.

(b) Samples taken in compliance with the monitoring requirements specified below shall be taken at locations prescribed in Part II, C.

	Daily Effluent Limitations					Monitoring Requirements	
	Quantity-kg/day (lbs/day)		Other Limitations (Specify Units)			Sample	Sample
Effluent Characteristic	Average*	Maximum	Minimum	Average	Maximum	Frequency	Type
Total Flow			—	—	—	Daily	Continuous
BOD_5	22,669 (50,090)	—	—	30 mg/l	—	Daily	24 hr. composite
BOD_5	34,002 (75,060)	—	—	45 mg/l	—	Daily	24 hr. composite
Suspended Solids (Monthly)	22,669 (50,090)	—	—	30 mg/l	—	Daily	24 hr. composite
Suspended Solids (Weekly)	34,002 (75,060)	—	—	45 mg/l	—	Daily	24 hr. composite
pH	—	—	6.0	—	9.0	2xDaily	Grab
Fecal Coliform (Monthly)	—	—	—	200/100 ml	—	2xWeekly	Grab
Fecal Coliform (Weekly)	—	—	—	400/100 ml	—	2xWeekly	Grab
Total Phosphorus (Monthly)	758 (1,670)	—	—	1 mg/l	—	1xDaily	24 hr. composite
Total Residual Chlorine**	—	—	—	—	—	Daily	Grab
Free Available Chlorine***	—	—	—	—	—	2xWeekly	Grab

*Load limitations have been calculated using a flow of 200 MGD.

**Total residual chlorine shall be monitored using the amperometric tritration method.

***Free available chlorine shall be monitored using both the orthotolidine method and the amperometric titration method.

B. The arithmetic mean of the values for effluent samples of 5-day BOD and suspended solids collected in a reporting period shall not exceed 15 percent of the arithmetic mean of the values for influent samples collected at approximately the same time during the same period (85 percent removal).

C. Sample Collection Locations

1. Beginning on the effective date of this permit the permittee shall collect influent samples at a point prior to the discharge of sewage wastes to the aeration basins. By January 1, 1976, the permittee shall install equipment and collect influent samples following coarse screening and preceding the grit chambers. These samples shall be analyzed for BOD, Suspended Solids and Total Phosphorus as a minimum. These samples shall be taken on the same frequency and with the same sample type as the effluent.

2. The permittee shall collect effluent samples from both the East Plant and the West Plant at a point following the final clarifiers of each plant, respectively. These samples shall be analyzed for BOD, Suspended Solids, pH, and Total Phosphorus as a minimum, in accordance with the sampling frequency and sample type contained in Part II, Page 1 of 6.

3. The permittee shall collect samples of the combined outfall following disinfection and immediately prior to discharge to Lake Michigan. These samples shall be analyzed for BOD, Suspended Solids, pH, Total Phosphorus, Fecal Coliform, Residual Chlorine and Free Available Chlorine as a minimum, in accordance with the sampling frequency and sample type contained in Part II, paragraph A. Compliance with the effluent limitations as stated in Part II, page 1

of 6, will be determined based on the analysis of samples collected as specified in this paragraph.

4. The permittee shall measure total effluent flow, and effluent flow from both the East Plant and the West Plant.

D. MONITORING AND RECORDING

1. *Sampling Requirements*

Unless specified otherwise herein, samples shall be taken in accordance with Chapter NR 218 of the Wisconsin Administrative Code.

2. *Reporting*

a. Monitoring reports and reports required by Section 12, 20, 21 and 23 of Part I of this permit shall be signed by a principal executive officer, a ranking elected official, or other duly authorized representative.

b. Monitoring results obtained during the previous month shall be summarized and reported on a Discharge Monitoring Report Form, postmarked no later than the 15th day of the month following the completed reporting period. The first report is due on February 15, 1975. Duplicate signed copies of these shall be submitted to the:

Wisconsin Department of Natural Resources
Southeast District
Division of Environmental Protection (Permits)
11611 West North Avenue
Milwaukee, Wisconsin 53226

c. All other reports required herein shall be submitted to the:

Wisconsin Department of Natural Resources
WPDES Permit Section
Post Office Box 450
Madison, Wisconsin 53701

3. Additional monitoring requirements to be reported to the Wisconsin Department of Natural Resources, WPDES Permit Section:

a. The influent 5-day BOD and suspended solids shall be monitored on the same frequency with the same sample type as required of the effluent.

b. Flow measurement of the wastewater volume received at the treatment plant, including any bypassed flow, shall be monitored continuously.

4. *Disposal of Collected Solids*—The permittee shall provide the Wisconsin Department of Natural Resources a report by September 30, 1975 containing data on the disposal of collected solids. The report shall specifically contain as a minimum—

a. The average volume of grit disposed on a monthly basis.

b. The average volume of fine screenings disposed on a monthly basis.

c. The average volume of waste activated sludge disposed on a monthly basis.

d. The type of treatment effected prior to disposal of grit and screenings.

e. The means by which the grit and screenings are disposed.

f. The exact location of all grit and screenings disposal areas.

g. The average volume of Milorganite produced on a monthly basis.

Based upon an analysis of this report, this permit may be revised or modified to include provisions for the disposal of collected solids.

5. Requirements for effluent limitations on pollutants attributable to industrial users:

a. Effluent limitations on pollutants from this discharger are listed in this permit. It is apparent that other pollutants attributable to inputs from significant industrial users of the municipal system are also present in the permittee's discharge. At such time as sufficient information becomes available to establish limitations for such pollutants, and after notice and opportunity for public hearing as provided in Chapter NR 3 of the Wisconsin Administrative Code, this permit may be revised to specify effluent limitations for any or all of such other pollutants.

b. As required by Chapter NR 211 of the Wisconsin Administrative Code, the permittee shall, with respect to all major contributing industries impose such pretreatment requirements on such industrial users as may be necessary to assure compliance by the permittee with all applicable effluent limitations set forth in this permit. A major contributing industry is one that: (a) has a flow of 50,000 gallons or more per average work day; (b) has a flow greater than five percent of the flow carried by the municipal system receiving the waste; (c) has a material in its discharge included on a list of toxic pollutants issued under Section 147.07(1), Wisconsin Statutes, or (d) has significant impact, either singularly or in combination with other contributing industries, on the treatment works or the quality of its effluent.

Starting on December 31, 1975, the permittee shall provide a report once every three months to the Department WPDES Permit Section regarding the pretreatment requirements which have been imposed on each major industrial user and the results achieved therefrom.

c. Immediately upon issuance of this permit, the permittee shall establish and implement a procedure to obtain from all significant industrial users specific information on the quality and quantity of effluents introduced by such industrial users and their impact on the overall municipal discharge. The form prescribed in Chapter NR 202 of the Wisconsin Administrative Code shall be submitted to the Department by the permittee for each significant industrial user which (1) discharges at least 10,000 gallons of effluent on any day of the year into this permitted treatment works, (2) has a flow greater than five percent of the total flow carried by the municipal system receiving the waste, (3) has a toxic material in its discharge, or (4) has been notified in writing by the Department that it is necessary to complete this form. All NR 202 forms shall be submitted to the Department on a quarterly basis beginning December 31, 1975; quarterly reports reflecting no change from the previous quarter may simply relate this fact without submitting repetitive data. NR 202 requires significant industrial users to submit to the permittee this form upon request of the permittee.

6. The Sewerage Commission of the City of Milwaukee is required to initiate a program leading to the elimination or control of all discharge overflow and/or bypass points in the Jones Island Collector System at discharge points

003 through 019, 021, 023, 024, 026, 029 through 032, 044 through 046, 048 through 050 (as identified below) to assure attainment of all applicable Water Quality Standards.

a. On or before December 31, 1975, the permittee shall submit to the Wisconsin Department of Natural Resources a plan for the elimination of all discharge points noted above (except those in the combined sewer area which are covered in subparagraph C). Such plan shall include alternative engineering solutions for the elimination of each discharge point, a recommended solution for the elimination of each discharge point, an estimate of cost for the elimination of each discharge point and a time schedule for the elimination of each discharge point. If it is determined by the Department that the plan is incomplete or inadequate, the plan may be returned to the permittee with the reasons therefore, following which the plan shall be modified by the permittee and resubmitted within 60 days. After acceptance by the Department of an adequate plan, this permit may be modified to incorporate the specific provisions and time schedules contained in the plan.

b. On or before June 30, 1975, the permittee shall complete "Attachment A" for each discharge identified below, and submit the completed forms to the Department.

c. The permittee shall complete facilities planning for the combined sewer area in accordance with the terms and conditions of Treatment Works Grant C550772-01. The facilities planning elements include a feasibility study, cost-effectiveness analysis and environmental assessment for elimination or control of the discharges from the combined sewers. The permittee shall submit to the Department of Natural Resources, WPDES Permit Section, quarterly progress reports on the facilities planning process. The first quarterly report shall be due March 31, 1975.

d. On or before March 31, 1975, the permittee shall identify to the Department 7 discharge points (chosen from those identified below) which are considered by the permittee to have the most significant impact on water quality. Following concurrence by the Department, the permittee shall by December 31, 1975, install equipment to continuously measure all flows discharged from the 7 selected discharges and shall install equipment to adequately sample the flow discharged. Beginning March 31, 1976, and every three months thereafter until the discharges are eliminated or controlled, the permittee shall submit a report to the Department containing data on the date of discharge, volume of discharge and sample analysis for each discharge. Each sample shall be analyzed for BOD, Suspended Solids, pH, Fecal Coliform and any other parameters that the Department may require. In event the facilities planning referred to in (c) above identifies more than 7 discharges which will be monitored, the permittee shall submit on a quarterly basis information on all discharges monitored beginning at the close of the quarter during which the monitoring is initiated.

"ATTACHMENT A"

1. Discharge Serial Number:

2. Discharge Location: _____

3. Name of Receiving Water: _____

4. Occurrence (check when discharge occurs)

   Wet weather _____Yes, _____No
   Dry weather _____Yes, _____No

5. Frequency (Give the actual or approximate number of incidents per year)

   Wet weather _____times per year
   Dry weather _____times per year

6. Duration (Give the average duration per event in hours)

   Wet weather _____hours
   Dry weather _____hours

7. Volume (Give the average volume per incident in thousand gallons)

   Wet weather _____thousand gallons per incident
   Dry weather _____thousand gallons per incident

8. Reason (Give brief reason or justification for discharge)

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES
Box 450—Madison, Wisconsin 53701
L. P. Voight, Secretary

In Reply Refer to: 3420

Certified Mail
Return Receipt Requested

Mr. Robert J. Bochardt
Chief Engineer & General Manager
Sewerage Commission of the City of Milwaukee
P.O. Box 2079
Milwaukee, Wisconsin 53201

RE: Amendment of WPDES Permit No. WI-0024767 (Jones Island)

Dear Mr. Bochardt:

The Department has discovered that some confusion may exist as to what is actually required under Part II, page 2 of 6, Sample Collection Locations.

The page which is attached, namely, page 2 of 6 of Part II, replaces page 2 of 6 of Part II, of the original permit issued on December 27, 1974. Paragraphs 1, 2 and 3 under Sample Collection Locations have been reworded to clearly indicate what is required. The requirements have in no way been changed from the issued permit. Please replace the original page with this attached modified page in all copies of the permit which you retain in your records. All discharges from this facility and actions or reports relating thereto shall be in accordance with the terms and conditions of the original permit.

The WPDES permit program has been approved by the Administrator of the U.S. Environmental Protection Agency pursuant to Section 402(b) of the Federal Water Pollution Control Act Amendments of 1972 (33 U.S.C. Section 1342(b)). Therefore, this permit is subject to enforcement

under Section 147.21 and 147.29, Wisconsin Statutes and Section 309 of the Federal Act (33 U.S.C. Section 1319).

/s/ Oliver D. Williams
Oliver D. Williams
Acting Administrator
Division of Environmental Standards

Dated January 9, 1975

cc: U.S. Environmental Protection Agency
Attn: Permits Branch
Southeastern District

SPECIAL CONDITIONS

B. The arithmetic mean of the values for effluent samples of 5-day BOD and suspended solids collected in a reporting period shall not exceed 15 percent of the arithmetic mean of the values for influent samples collected at approximately the same time during the same period (85 percent removal).

C. Sample Collection Locations

1. Beginning on the effective date of this permit the permittee shall collect influent samples (24 hour composites, daily) at a point prior to the discharge of sewage wastes to the aeration basins. By January 1, 1976, the permittee shall install equipment and collect influent samples following coarse screening and preceding the grit chambers. These samples shall be analyzed for BOD, Suspended Solids and Total Phosphorus as a minimum.

2. The permittee shall collect effluent samples (24 hour composites, daily) from both the East Plant and the West Plant at a point following the final clari-

fiers of each plant, respectively. These samples shall be analyzed for BOD, Suspended Solids, pH, and Total Phosphorus as a minimum.

3. The permittee shall collect samples (24 hour composites, daily) of the combined outfall following disinfection and immediately prior to discharge to Lake Michigan. These samples shall be analyzed for BOD, Suspended Solids, pH, Total Phosphorus, Fecal Coliform, Residual Chlorine and Free Available chlorine as a minimum, in accordance with the sampling frequency contained in Part II, paragraph A. Compliance with the effluent limitations as stated in Part II, page 1 of 6, will be determined based on the analysis of samples collected as specified in this paragraph.

4. The permittee shall measure total effluent flow, and effluent flow from both the East Plant and the West Plant.

GENERAL CONDITIONS

1. *Compliance*

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of the permit.

2. *Adverse Impact*

The permittee shall take all reasonable steps to minimize any adverse impact on waters of the State resulting from noncompliance with any effluent limitations specified in this permit, including such special or additional monitoring as may be required by the Department or may be necessary to determine the nature and impact of the noncomplying discharge.

3. *Removed Substances*

Solids, sludges, filter backwash or other pollutants removed from or resulting from treatment or control of wastewaters or intake waters shall be stored and disposed of in a manner such as to prevent any pollutant from such materials from entering the waters of the State. Land disposal of treatment plant solids and sludges shall be either at a site or operation licensed by the Department under Chapter NR 151,Wisconsin Administrative Code, or in accordance with a sludge disposal plan approved by the Department.

4. *Right of Entry*

The permittee shall allow authorized representatives of the Department of Natural Resources, and the Administrator of the United States Environmental Protection

Agency or his authorized representatives, upon the presentation of credentials:

a. To enter upon the permittee's premises where an effluent source is located or in which any records are required to be kept under the terms and conditions of this permit; and

b. At reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit; to inspect any monitoring equipment or monitoring method required in this permit; and to sample any wastewaters.

5. *Permit Modification*

After notice and opportunity for a hearing as provided in Section 147.03, Wisconsin Statutes, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to, the following:

a. Violation of any terms or conditions of this permit;

b. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or

c. A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge.

6. *Toxic Pollutants*

Nothing in this permit shall be construed to authorize the discharge of any toxic pollutant or combination of pollutants in amounts or concentrations which exceed any applicable toxic effluent standard or prohibition, including

any schedule of compliance specified in any such effluent standard or prohibition, promulgated under Section 147.07 (1), Wisconsin Statutes.

If a toxic effluent standard or prohibition, including any schedule of compliance specified in such effluent standard or prohibition, is promulgated under Section 147.07(1), Wisconsin Statutes, for a toxic pollutant or combination of pollutants which is present in the discharge and such standard or prohibition is more stringent than any limitation for such pollutant in this permit, this permit shall be revised or modified in accordance with the toxic effluent standard or prohibition.

7. *Civil and Criminal Liability*

Except as provided in permit conditions on "Bypassing" (Part I, 23) and "Power Failures" (Part I, 24), nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties under Section 147.21, Wisconsin Statutes, for noncompliance with the terms and conditions of this permit.

8. *Oil and Hazardous Substance Liability*

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Federal Water Pollution Control Act (33 U.S.C. Section 1321).

9. *State Laws*

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any other applicable State law or regulation.

10. *Property Rights*

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

11. *Severability*

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

12. *Schedule of Compliance Progress Reports*

No later than 14 calendar days following a date identified in any schedule of compliance in Part II, the permittee shall submit either a report of progress or, in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance. In the latter case, the notice shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirements.

13. *Test Procedures*

Test procedures used for the analysis of pollutants shall be those listed in Chapter NR 219, Wisconsin Administrative Code, or an alternate method authorized in Part II.

14. *Recording of Results*

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

a. The exact place, date, and time of sampling;

b. The dates the analyses were performed;

c. The person(s) who performed the analyses;

d. The analytical techniques or methods used; and

e. The results of all required analyses.

15. *Additional Monitoring by Permittee*

If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified in Chapter NR 219, the results of such monitoring shall be included in the Discharge Monitoring Report Form 3200-28. Such increased frequency shall also be indicated.

16. *Records Retention*

All records and information resulting from the monitoring activities required by this permit including all records of analysis performed and calibration and maintenance of instrumentation and recordings from continuous monitoring instrumentation shall be retained for a minimum of three (3) years, or longer if requested by the Department of Natural Resources.

17. *Construction of Onshore or Offshore Structures*

This permit does not authorize or approve the construction of any onshore or offshore physical structure of facilities or the undertaking of any work in any navigable waters.

18. *Confidential Information*

Except for data determined to be confidential under Section 147.08(2)(c), Wisconsin Statutes, all monitoring reports required by this permit shall be available for public inspection at the headquarters of U.S. EPA Region V and the Department of Natural Resources. Knowingly making any

false statement on any such report may result in the imposition of criminal penalties as provided for in Section 147.21, Wisconsin Statutes.

19. *Transfer of Control of Operation*

In the event of a transfer of control of operation of the facility from which the permitted discharges emanate to a person not named on page one (1) of this permit, the permittee prior to such transfer shall notify his successor by letter that this permit is not transferable and that prior to any discharge after such transfer, a new WPDES permit must be obtained. A copy of this letter shall be forwarded to the Department of Natural Resources, WPDES Permit Section, Box 450, Madison, Wisconsin 53701.

20. *Change in Discharge*

Facility modifications, additions, and/or expansions that increase the plant capacity must be reported to the Department and this permit then modified or reissued to reflect such changes. Any anticipated change in the facility discharge, including any new significant industrial discharge or significant changes in the quantity or quality of existing industrial discharges of pollutants must be reported to the Department. Modifications to the permit may then be made to reflect any necessary changes in permit conditions, including any necessary effluent limitations for any pollutants not identified and limited herein. In no case are any new connections, increased flows, or significant changes in influent quality permitted that will cause violation of the effluent limitations specified herein.

21. *Noncompliance Notification*

If for any reason the permittee does not comply with or will be unable to comply with any effluent limitation speci-

fied in this permit, or should any unusual or extraordinary discharge of wastes occur from the facilities herein permitted, the permittee shall provide the Department in writing within five days of such occurrence with the following information:

a. A description of the noncomplying discharge including its impact upon the receiving waters.

b. Cause of noncompliance.

c. Anticipated time the condition of noncompliance is expected to continue, or if such condition has been corrected, the duration of the period of noncompliance.

d. Steps taken by the permittee to reduce and eliminate the noncomplying discharge.

e. Steps to be taken by the permittee to prevent recurrence of the condition of noncompliance.

22. *Facility Operation and Quality Control*

All waste collection, control, treatment and disposal facilities shall be operated in a manner consistent with the following:

a. At all times, all facilities shall be operated as efficiently as possible and in a manner which will minimize upsets and discharges of excessive pollutants.

b. The municipal wastewater treatment facility must be under the supervision of a State certified operator as required by Chapter NR 114 of the Wisconsin Administrative Code.

c. Maintenance of treatment facilities that results in degradation of effluent quality shall be scheduled during non-critical water quality periods and shall be carried out in a manner approved by the Department.

23. *Bypassing*

The diversion or bypass of any discharge at the treatment works is prohibited except (i) an inadvertent bypass lasting no longer than one hour and resulting from equipment damage or temporary power interruption, or (ii) an unavoidable bypass necessary to prevent loss of life or severe property damage, or (iii) a bypass of excessive storm drainage or runoff which would damage any facilities necessary for compliance with the effluent limitations and

prohibitions of this permit. In the event of occurrence of a bypass described by (ii) or (iii) the permittee shall immediately notify the Department District Office by telephone of such occurrence. In addition, the permittee shall notify the Department of Natural Resources, WPDES Permit Section and the Administrator of the U.S. EPA—Region V in writing of each such diversion or bypass by letter within 72 hours.

24. *Power Failures*

The permittee is responsible for maintaining adequate safeguards to prevent the discharge of untreated or inadequately treated wastes during electrical power failure either by means of alternate power sources, standby generators or retention of inadequately treated effluent. Should the treatment works not have the above capabilities at the time of permit issuance, the permittee must furnish within 120 days to the Department, for approval, plans for such facilities and an implementation schedule for their installation.

25. *Pretreatment*

The permittee shall require any industrial user of the permitted facility to provide pretreatment as required under Section 147.07(2), Wisconsin Statutes to provide any rec-

ords, reports or information related to any pretreatment or new source performance standards. Any industrial user of the permitted facility shall be required by the permittee to prepare and submit to the WPDES Permit Section periodic notices of progress toward full compliance with the requirements of Section 147.07(2), Wisconsin Statutes. Such notices shall be submitted at intervals not to exceed 9 months or as required elsewhere in this permit.

26. *Prohibited Wastes*

Under no circumstances shall the permittee allow introduction into the waste treatment system of wastes prohibited by NR 211.10, Wisconsin Administrative Code, which include those

a. Which create a fire or explosion hazard in the treatment works,

b. Which will cause corrosive structural damage to treatment works,

c. Solid or viscous substances in amounts which cause obstructions to the flow in sewers or interference with the proper operation of the treatment works,

d. Wastewaters at a flow rate and/or pollutant discharge rate which is excessive over relatively short time periods so as to cause a loss of treatment efficiency,

e. New wastes or increased volumes or quantities of wastes from major contributing industries in such volumes or quantities as to overload the treatment works or cause a loss of treatment efficiency.

27. *Definition Terms*

(i) For those terms used in Parts I and II which are defined in Section 147.015, Wisconsin Statutes, the meanings of that Section shall apply.

(ii) As used in Daily Effluent Limitations, Part II:

(1) "Average" means the arithmetic mean of daily monitoring test results obtained during a calendar month for the given parameter; that is the total of such daily results, in pounds per day, milligrams per

liter, or other appropriate unit divided by the number of days for which results are totaled. For example, if a facility operates or discharges and monitors 30 days during a month the daily average is the sum of daily values in pounds per day, milligrams per liter, or other appropriate unit divided by 30 for each parameter, but if one day's result is missing for any parameter the divisor in that case is 29.

(2) "Maximum" means the highest daily monitoring test result, in pounds per day, milligrams per liter, or other appropriate unit during the calendar month for the given parameter.

(3) "Minimum" means the lowest daily monitoring test result, in the appropriate unit, during the calendar month for the given parameter.

(4) The "average" for fecal coliform bacteria shall be the geometric mean of the samples collected in a reported period.

Permit No. WI-0024775
Application No. WI-0024775

Plaintiff's Exhibit 63 (relevant portions)

PERMIT TO DISCHARGE UNDER THE WISCONSIN POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of Chapter 147, Wisconsin Statutes,

THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE
is permitted to discharge from a facility located at

8500 SOUTH FIFTH AVENUE, OAK CREEK
(SOUTH SHORE PLANT)

to LAKE MICHIGAN

in accordance with the effluent limitations, monitoring requirements and other conditions set forth in Parts I and II hereof.

This permit shall become effective on the date of signature.

This permit to discharge shall expire at midnight, June 30, 1977.

Permittee shall not discharge after the date of expiration. If the permittee wishes to continue to discharge after this expiration date he shall file an application for reissuance of his permit in accordance with the requirements of Chapter NR 200, Wisconsin Administrative Code, at least 180 days prior to this expiration date.

State of Wisconsin Department of Natural Resources
For the Secretary

By /s/ OLIVER D. WILLIAMS
Oliver D. Williams
Acting Administrator
Division of Environmental Standards

Dated this 18th day of December, 1974

GENERAL CONDITIONS

1. *Compliance*

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of the permit.

2. *Adverse Impact*

The permittee shall take all reasonable steps to minimize any adverse impact on waters of the State resulting from noncompliance with any effluent limitations specified in this permit, including such special or additional monitoring as may be required by the Department or may be necessary to determine the nature and impact of the noncomplying discharge.

3. *Removed Substances*

Solids, sludges, filter backwash or other pollutants removed from or resulting from treatment or control of wastewaters or intake waters shall be stored and disposed of in a manner such as to prevent any pollutant from such materials from entering the waters of the State. Land disposal of treatment plant solids and sludges shall be either at a site or operation licensed by the Department under Chapter NR 151,Wisconsin Administrative Code, or in accordance with a sludge disposal plan approved by the Department.

4. *Right of Entry*

The permittee shall allow authorized representatives of the Department of Natural Resources, and the Adminis-

trator of the United States Environmental Protection Agency or his authorized representatives, upon the presentation of credentials:

a. To enter upon the permittee's premises where an effluent source is located or in which any records are required to be kept under the terms and conditions of this permit; and

b. At reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit; to inspect any monitoring equipment or monitoring method required in this permit; and to sample any wastewaters.

5. *Permit Modification*

After notice and opportunity for a hearing as provided in Section 147.03, Wisconsin Statutes, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to, the following:

a. Violation of any terms or conditions of this permit;

b. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or

c. A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge.

6. *Toxic Pollutants*

Nothing in this permit shall be construed to authorize the discharge of any toxic pollutant or combination of pollutants in amounts or concentrations which exceed any applicable toxic effluent standard or prohibition, including

any schedule of compliance specified in any such effluent standard or prohibition, promulgated under Section 147.07 (1), Wisconsin Statutes.

If a toxic effluent standard or prohibition, including any schedule of compliance specified in such effluent standard or prohibition, is promulgated under Section 147.07(1), Wisconsin Statutes, for a toxic pollutant or combination of pollutants which is present in the discharge and such standard or prohibition is more stringent than any limitation for such pollutant in this permit, this permit shall be revised or modified in accordance with the toxic effluent standard or prohibition.

7. *Civil and Criminal Liability*

Except as provided in permit conditions on "Bypassing" (Part I, 23) and "Power Failures" (Part I, 24), nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties under Section 147.21, Wisconsin Statutes, for noncompliance with the terms and conditions of this permit.

8. *Oil and Hazardous Substance Liability*

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Federal Water Pollution Control Act (33 U.S.C. Section 1321).

9. *State Laws*

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any other applicable State law or regulation.

10. *Property Rights*

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

11. *Severability*

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

12. *Schedule of Compliance Progress Reports*

No later than 14 calendar days following a date identified in any schedule of compliance in Part II, the permittee shall submit either a report of progress or, in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance. In the latter case, the notice shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirements.

13. *Test Procedures*

Test procedures used for the analysis of pollutants shall be those listed in Chapter NR 219, Wisconsin Administrative Code, or an alternate method authorized in Part II.

14. *Recording of Results*

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

a. The exact place, date, and time of sampling;

b. The dates the analyses were performed;

c. The person(s) who performed the analyses;

d. The analytical techniques or methods used; and

e. The results of all required analyses.

15. *Additional Monitoring by Permittee*

If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified in Chapter NR 219, the results of such monitoring shall be included in the Discharge Monitoring Report Form 3200-28. Such increased frequency shall also be indicated.

16. *Records Retention*

All records and information resulting from the monitoring activities required by this permit including all records of analysis performed and calibration and maintenance of instrumentation and recordings from continuous monitoring instrumentation shall be retained for a minimum of three (3) years, or longer if requested by the Department of Natural Resources.

17. *Construction of Onshore or Offshore Structures*

This permit does not authorize or approve the construction of any onshore or offshore physical structure of facilities or the undertaking of any work in any navigable waters.

18. *Confidential Information*

Except for data determined to be confidential under Section 147.08(2)(c), Wisconsin Statutes, all monitoring reports required by this permit shall be available for public inspection at the headquarters of U.S. EPA Region V and the Department of Natural Resources. Knowingly making any false statement on any such report may result in the im-

position of criminal penalties as provided for in Section 147.21, Wisconsin Statutes.

19. *Transfer of Control of Operation*

In the event of a transfer of control of operation of the facility from which the permitted discharges emanate to a person not named on page one (1) of this permit, the permittee prior to such transfer shall notify his successor by letter that this permit is not transferable and that prior to any discharge after such transfer, a new WPDES permit must be obtained. A copy of this letter shall be forwarded to the Department of Natural Resources, WPDES Permit Section, Box 450, Madison, Wisconsin 53701.

20. *Change in Discharge*

Facility modifications, additions, and/or expansions that increase the plant capacity must be reported to the Department and this permit then modified or reissued to reflect such changes. Any anticipated change in the facility discharge, including any new significant industrial discharge or significant changes in the quantity or quality of existing industrial discharges of pollutants must be reported to the Department. Modifications to the permit may then be made to reflect any necessary changes in permit conditions, including any necessary effluent limitations for any pollutants not identified and limited herein. In no case are any new connections, increased flows, or significant changes in influent quality permitted that will cause violation of the effluent limitations specified herein.

21. *Noncompliance Notification*

If for any reason the permittee does not comply with or will be unable to comply with any effluent limitation specified in this permit, or should any unusual or extraordinary

discharge of wastes occur from the facilities herein permitted, the permittee shall provide the Department in writing within five days of such occurrence with the following information:

a. A description of the noncomplying discharge including its impact upon the receiving waters.

b. Cause of noncompliance.

c. Anticipated time the condition of noncompliance is expected to continue, or if such condition has been corrected, the duration of the period of noncompliance.

d. Steps taken by the permittee to reduce and eliminate the noncomplying discharge.

e. Steps to be taken by the permittee to prevent recurrence of the condition of noncompliance.

22. *Facility Operation and Quality Control*

All waste collection, control, treatment and disposal facilities shall be operated in a manner consistent with the following:

a. At all times, all facilities shall be operated as efficiently as possible and in a manner which will minimize upsets and discharges of excessive pollutants.

b. The municipal wastewater treatment facility must be under the supervision of a State certified operator as required by Chapter NR 114 of the Wisconsin Administrative Code.

c. Maintenance of treatment facilities that results in degradation of effluent quality shall be scheduled during non-critical water quality periods and shall be carried out in a manner approved by the Department.

23. *Bypassing*

The diversion or bypass of any discharge at the treatment works is prohibited except (i) an inadvertent bypass lasting no longer than one hour and resulting from equipment damage or temporary power interruption, or (ii) an unavoidable bypass necessary to prevent loss of life or severe property damage, or (iii) a bypass of excessive storm drainage or runoff which would damage any facilities necessary for compliance with the effluent limitations and

prohibitions of this permit. In the event of occurrence of a bypass described by (ii) or (iii) the permittee shall immediately notify the Department District Office by telephone of such occurrence. In addition, the permittee shall notify the Department of Natural Resources, WPDES Permit Section and the Administrator of the U.S. EPA—Region V in writing of each such diversion or bypass by letter within 72 hours.

24. *Power Failures*

The permittee is responsible for maintaining adequate safeguards to prevent the discharge of untreated or inadequately treated wastes during electrical power failure either by means of alternate power sources, standby generators or retention of inadequately treated effluent. Should the treatment works not have the above capabilities at the time of permit issuance, the permittee must furnish within 120 days to the Department, for approval, plans for such facilities and an implementation schedule for their installation.

25. *Pretreatment*

The permittee shall require any industrial user of the permitted facility to provide pretreatment as required under

Section 147.07(2), Wisconsin Statutes to provide any records, reports or information related to any pretreatment or new source performance standards. Any industrial user of the permitted facility shall be required by the permittee to prepare and submit to the WPDES Permit Section periodic notices of progress toward full compliance with the requirements of Section 147.07(2), Wisconsin Statutes. Such notices shall be submitted at intervals not to exceed 9 months or as required elsewhere in this permit.

26. *Prohibited Wastes*

Under no circumstances shall the permittee allow introduction into the waste treatment system of wastes prohibited by NR 211.10, Wisconsin Administrative Code, which include those

a. Which create a fire or explosion hazard in the treatment works,

b. Which will cause corrosive structural damage to treatment works,

c. Solid or viscous substances in amounts which cause obstructions to the flow in sewers or interference with the proper operation of the treatment works,

d. Wastewaters at a flow rate and/or pollutant discharge rate which is excessive over relatively short time periods so as to cause a loss of treatment efficiency,

e. New wastes or increased volumes or quantities of wastes from major contributing industries in such volumes or quantities as to overload the treatment works or cause a loss of treatment efficiency.

27. *Definition Terms*

(i) For those terms used in Parts I and II which are defined in Section 147.015, Wisconsin Statutes, the meanings of that Section shall apply.

(ii) As used in Daily Effluent Limitations, Part II:

(1) "Average" means the arithmetic mean of daily monitoring test results obtained during a calendar month for the given parameter; that is the total of such daily results, in pounds per day, milligrams per

liter, or other appropriate unit divided by the number of days for which results are totaled. For example, if a facility operates or discharges and monitors 30 days during a month the daily average is the sum of daily values in pounds per day, milligrams per liter, or other appropriate unit divided by 30 for each parameter, but if one day's result is missing for any parameter the divisor in that case is 29.

(2) "Maximum" means the highest daily monitoring test result, in pounds per day, milligrams per liter, or other appropriate unit during the calendar month for the given parameter.

(3) "Minimum" means the lowest daily monitoring test result, in the appropriate unit, during the calendar month for the given parameter.

(4) The "average" for fecal coliform bacteria shall be the geometric mean of the samples collected in a reported period.

SPECIAL CONDITIONS

Initial

A. Effluent Limitations and Monitoring Requirements

(1) During the period beginning on the effective date of the permit and lasting until December 31, 1974 the permittee is authorized to discharge from outfall serial number 002 (treatment plant outfall).

(2) This discharge shall be limited and monitored by the permittee as specified below.

(a) There shall be no discharge of floating solids or visible foam in other than trace amounts.

(b) Samples taken in compliance with the monitoring requirements specified below shall be taken at locations prescribed in Part II, E.

Effluent Characteristic	Daily Effluent Limitations					Monitoring Requirements	
	Quantity-kg/day (lbs/day)		Other Limitations (Specify Units)				
	Average*	Maximum	Minimum	Average	Maximum	Sample Frequency	Sample Type
Total Flow	—	—	—	—	—	Daily	Continuous
BOD_5 (Monthly)	28,335 (62,550)	—	—	125 mg/l	—	Daily	24 hr. composite
BOD_5 (Weekly)	42,616 (94,075)	—	—	188 mg/l	—	Daily	24 hr. composite
Suspended Solids (Monthly)	21,534 (47,538)	—	—	95 mg/l	—	Daily	24 hr. composite
Suspended Solids (Weekly)	32,415 (71,557)	—	—	143 mg/l	—	Daily	24 hr. composite
pH	—	—	6.0	—	9.0	2xDaily	Grab
Fecal Coliform (Monthly)	—	—	—	200/100 ml	—	2xWeekly	Grab
Fecal Coliform (Weekly)	—	—	—	400/100 ml	—	2xWeekly	Grab

*Load limitations have been calculated using a flow of 60 MGD.

B. Effluent Limitations and Monitoring Requirements

(1) During the period beginning on January 1, 1975 and lasting until June 30, 1975 the permittee is authorized to discharge from outfall serial number 002.

(2) This discharge shall be limited and monitored by the permittee as specified below.

(a) There shall be no discharge of floating solids or visible foam in other than trace amounts.

(b) Samples taken in compliance with the monitoring requirements specified below shall be taken at locations prescribed in Part II, E.

	Daily Effluent Limitations					Monitoring Requirements	
	Quantity-kg/day (lbs/day)		Other Limitations (Specify Units)				
Effluent Characteristic	Average*	Maximum	Minimum	Average	Maximum	Sample Frequency	Sample Type
Total Flow	—	—	—	—	—	Daily	Continuous
BOD_5	13,650 (30,000)	—	—	30 mg/l	—	Daily	24 hr. composite
BOD_5 (Weekly)	20,450 (45,000)	—	—	45 mg/l	—	Daily	24 hr. composite
Suspended Solids (Monthly)	13,650 (30,000)	—	—	30 mg/l	—	Daily	24 hr. composite
Suspended Solids (Weekly)	20,450 (45,000)	—	—	45 mg/l	—	Daily	24 hr. composite
pH	—	—	6.0	—	9.0	2xDaily	Grab
Fecal Coliform (Monthly)	—	—	—	200/100 ml	—	2xWeekly	Grab
Fecal Coliform (Weekly)	—	—	—	400/100 ml	—	2xWeekly	Grab
Total Phosphorus (Monthly)	1,365 (3,000)	—	—	3 mg/l	—	1xDaily	24 hr. composite
Total Residual Chlorine**	—	—	—	—	—	Daily	Grab
Free Available Chlorine***	—	—	—	—	—	2xWeekly	Grab

*Load limitations have been calculated using a flow of 120 MGD.

**Total residual chlorine shall be monitored using the amperometric titration method.

***Free available chlorine shall be monitored using both the orthotolidine method and the amperometric titration method.

C. Effluent Limitations and Monitoring Requirements

(1) During the period beginning on July 1, 1975 and lasting until the expiration date the permittee is authorized to discharge from outfall serial number 002.

(2) This discharge shall be limited and monitored by the permittee as specified below.

(a) There shall be no discharge of floating solids or visible foam in other than trace amounts.

(b) Samples taken in compliance with the monitoring requirements specified below shall be taken at locations prescribed in Part II, E.

Effluent Characteristic	Daily Effluent Limitations: Quantity-kg/day (lbs/day) Average*	Quantity-kg/day (lbs/day) Maximum	Other Limitations (Specify Units) Minimum	Other Limitations (Specify Units) Average	Other Limitations (Specify Units) Maximum	Monitoring Requirements: Sample Frequency	Monitoring Requirements: Sample Type
Total Flow	—	—	—	—	—	Daily	Continuous
BOD_5	13,650 (30,000)	—	—	30 mg/l	—	Daily	24 hr. composite
BOD_5 (Weekly)	20,450 (45,000)	—	—	45 mg/l	—	Daily	24 hr. composite
Suspended Solids (Monthly)	13,650 (30,000)	—	—	30 mg/l	—	Daily	24 hr. composite
Suspended Solids (Weekly)	20,450 (45,000)	—	—	45 mg/l	—	Daily	24 hr. composite
pH	—	—	6.0	—	9.0	2xDaily	Grab
Fecal Coliform (Monthly)	—	—	—	200/100 ml	—	2xWeekly	Grab
Fecal Coliform (Weekly)	—	—	—	400/100 ml	—	2xWeekly	Grab
Total Phosphorus (Monthly)	455 (1,000)	—	—	1 mg/l	—	1xDaily	24 hr. composite
Total Residual Chlorine**	—	—	—	—	—	Daily	Grab
Free Available Chlorine***	—	—	—	—	—	2xWeekly	Grab

*Load limitations have been calculated using a flow of 120 MGD.

**Total residual chlorine shall be monitored using the amperometric titration method.

***Free available chlorine shall be monitored using both the orthotolidine method and the amperometric titration method.

D. Beginning January 1, 1975 the arithmetic mean of the values for effluent samples of 5-day BOD and suspended solids collected in a reporting period shall not exceed 15 percent of the arithmetic mean of the values for influent samples collected at approximately the same time during the same period (85 percent removal).

E. Sample Collection Locations

1. Influent samples (24 hour composites, daily) shall be taken at a point upstream from the introduction of any recycled flows. Influent samples shall be analyzed for BOD, Suspended Solids and Total Phosphorus as a minimum.

2. Effluent samples (24 hour composites, daily) shall be taken at a point following disinfection. Effluent samples shall be analyzed for BOD, Suspended Solids, pH, Fecal Coliform, Total Phosphorus, Total Residual Chlorine, and Free available Chlorine as a minimum, in accordance with the sampling frequency contained in part II, paragraphs A and B.

E. MONITORING AND RECORDING

1. *Sampling Requirements*

Unless specified otherwise herein, samples shall be taken in accordance with Chapter NR 218 of the Wisconsin Administrative Code.

2. *Reporting*

a. Monitoring reports and reports required by Section 12, 20, 21 and 23 of Part I of this permit shall be signed by a principal executive officer, a ranking elected official, or other duly authorized representative.

b. Monitoring results obtained during the previous month shall be summarized and reported on a Discharge Monitor-

ing Report Form, postmarked no later than the 15th day of the month following the completed reporting period. The first report is due on February 15, 1975. Duplicate signed copies of these shall be submitted to the:

Wisconsin Department of Natural Resources
Southeast District
Division of Environmental Protection (Permits)
11611 West North Avenue
Milwaukee, Wisconsin 53226

c. All other reports required herein shall be submitted to the:

Wisconsin Department of Natural Resources
WPDES Permit Section
Post Office Box 450
Madison, Wisconsin 53701

3. *Schedule of Compliance**

The permittee shall achieve compliance with the effluent limitations contained in Part II in accordance with the following schedule:

a. Attain operational level July 1, 1975

4. Additional monitoring requirements to be reported to the Wisconsin Department of Natural Resources, WPDES Permit Section:

a. The influent 5-day BOD and suspended solids shall be monitored on the same frequency with the same sample type as required of the effluent.

b. Flow measurement of the wastewater volume received at the treatment plant, including any bypassed flow, shall be monitored continuously.

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*The permittee shall comply with the above schedule of compliance for upgrading the South Shore Wastewater Treatment Plant to provide adequate phosphorus removal.

c. The permittee shall report to the Wisconsin Department of Natural Resources when the average daily wastewater flow to the treatment plant or the 5-day biochemical oxygen demand loading exceeds 100 $X10^6$ gpd and 232,000 pounds/day respectively for a three month consecutive period.

5. *Disposal of Collected Solids*—The permittee shall provide the Wisconsin Department of Natural Resources a report by March 31, 1975 containing data on the disposal of collected solids. The report shall specifically contain as a minimum—

a. The average volume of sludge disposed on a monthly basis,

b. The type of sludge treatment effected prior to its disposal,

c. The means by which the sludge is disposed and

d. The exact location of all sludge disposal areas.

Based upon an analysis of this report, this permit may be revised or modified to include provisions for the disposal of collected solids.

6. Requirements for effluent limitations on pollutants attributable to industrial users:

a. Effluent limitations on pollutants from this discharger are listed in this permit. It is apparent that other pollutants attributable to inputs from significant industrial users of the municipal system are also present in the permittee's discharge. At such time as sufficient information becomes available to establish limitations for such pollutants, and after notice and opportunity for public hearing as provided in Chapter NR 3 of the Wisconsin Administrative Code, this

permit may be revised to specify effluent limitations for any or all of such other pollutants.

b. As required by Chapter NR 211 of the Wisconsin Administrative Code, the permittee shall, with respect to all major contributing industries impose such pretreatment requirements on such industrial users as may be necessary to assure compliance by the permittee with all applicable effluent limitations set forth in this permit. A major contributing industry is one that: (a) has a flow of 50,000 gallons or more per average work day; (b) has a flow greater than five percent of the flow carried by the municipal system receiving the waste; (c) has a material in its discharge included on a list of toxic pollutants issued under Section 147.07(1), Wisconsin Statutes, or (d) has significant impact, either singularly or in combination with other contributing industries, on the treatment works or the quality of its effluent.

Starting on December 31, 1975, the permittee shall provide a report once every three months to the Department WPDES Permit Section regarding the pretreatment requirements which have been imposed on each major industrial user and the results achieved therefrom.

c. Immediately upon issuance of this permit, the permittee shall establish and implement a procedure to obtain from all significant industrial users specific information on the quality and quantity of effluents introduced by such industrial users and their impact on the overall municipal discharge. The form prescribed in Chapter NR 202 of the Wisconsin Administrative Code shall be submitted to the Department by the permittee for each significant industrial user which (1) discharges at least 10,000 gallons of

effluent on any day of the year into this permitted treatment works, (2) has a flow greater than five percent of the total flow carried by the municipal system receiving the waste, (3) has a toxic material in its discharge, or (4) has been notified in writing by the Department that it is necessary to complete this form. All NR 202 forms shall be submitted to the Department on a quarterly basis beginning December 31, 1975; quarterly reports reflecting no change from the previous quarter may simply relate this fact without submitting repetitive data. NR 202 requires significant industrial users to submit to the permittee this form upon request of the permittee.

7. The Sewerage Commission of the City of Milwaukee is required to initiate a program leading to the elimination of all discharge overflow and/or bypass points in the South Shore Collector System at discharge points 020, 022, 025, 027, 028, 033 through 043 and 047 (as identified below) to assure attainment of all applicable Water Quality Standards.

a. On or before December 31, 1975, the permittee shall submit to the Wisconsin Department of Natural Resources a plan for the elimination of all discharge points noted above. Such plan shall include alternative engineering solutions for the elimination of each discharge point, a recommended solution for the elimination of each discharge point, an estimate of cost for the elimination of each discharge point and a time schedule for the elimination of each discharge point. If it is determined by the Department that the plan is incomplete or inadequate, the plan may be returned to the permittee with the reasons therefore, following which the plan shall be modified by the permittee and resubmitted within 60 days. After acceptance by the Department of an adequate plan, this permit may be modified to incorporate the specific provisions and time schedules contained in the plan.

b. On or before June 30, 1975, the permittee shall complete "Attachment A" for each discharge identified below, and submit the completed forms to the Department.

c. On or before March 31, 1975, the permittee shall identify to the Department 5 discharge points (chosen from those identified below) which are considered by the permittee to have the most significant impact on water quality. Following concurrence by the Department, the permittee shall by December 31, 1975, install equipment to continuously measure all flows discharged from the 5 selected discharges and shall install equipment to adequately sample the flow discharged. Beginning March 31, 1976, and every three months thereafter until the discharges are eliminated, the permittee shall submit a report to the Department containing data on the date of discharge, volume of discharge and sample analysis for each discharge. Each sample shall be analyzed for BOD, Suspended Solids, pH, Fecal Coliform and any other parameters that the Department may require.

Part II. Page 8 of 8

DISCHARGE BYPASS AND/OR OVERFLOW POINTS IN THE SOUTH SHORE COLLECTOR SYSTEM

Serial No.	Location
020	S. Howell Avenue at E. Grange Avenue
022	Menomonee River Parkway at W. Center Street
025	S. 35th Street at W. Manitoba Street
027	W. Hampton Avenue at N. 63rd Street Ext'd
028	S. 84th Street at W. Adler Street Ext'd
033	W. Fisher Parkway at N. 106th Street

034	Honey Creek Parkway at W. Portland Avenue
035	Honey Creek Parkway at W. Wisconsin Avenue
036	Menomonee River Parkway, 600 feet S. of W. North Avenue
037	Menomonee River Parkway, 300 feet E. of N. 68th Street
038	N. Martha Washington Drive, 450 feet South of W. Vliet Street
039	N. 62nd Street, 258 feet S. of W. Martin Drive
040	N. 62nd Street and W. Martin Drive
041	S. 60th Street of S. side of the Kinnickinnic River
042	S. 79th Street Ext'd at W. Dickinson Street Ext'd
043	W. Lincoln Avenue at 565 feet W. of S. 43rd Street
047	W. Oklahoma Avenue, 100 feet W. of S. 74th Street

"ATTACHMENT A"

1. Discharge Serial Number:

2. Discharge Location: _____

3. Name of Receiving Water: _____

4. Occurrence (check when discharge occurs)
   Wet weather _____Yes, _____No
   Dry weather _____Yes, _____No

5. Frequency (Give the actual or approximate number of incidents per year)

   Wet weather _____times per year
   Dry weather _____times per year

6. Duration (Give the average duration per incident in hours)

7. Volume (Give the average volume per incident in thousand gallons)

   Wet weather _____thousand gallons per incident
   Dry weather _____thousand gallons per incident

8. Reason (Give brief reason or justification for discharge)

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES
Box 450—Madison, Wisconsin 53701
L. P. Voight, Secretary

In Reply Refer to: 3420

Certified Mail
Return Receipt Requested

Mr. Robert J. Bochardt
Chief Engineer & General Manager
Sewerage Commission of the City of Milwaukee
P.O. Box 2079
Milwaukee, Wisconsin 53201

RE: Amendment of WPDES Permit No. WI-0024775

Dear Mr. Bochardt:

The Department has discovered that some confusion may exist as to what is actually required under Part II, page 2 of 8, Sample Collection Locations.

The page which is attached, namely, page 4 of 8 of Part II, replaces page 4 of 8 of Part II, of the original permit issued on December 18, 1974. Paragraphs 1 and 2 under Sample Collection Locations have been reworded to clearly indicate what is required. The requirements have not been changed from the issued permit. Please replace the original page with this attached modified page in all copies of the permit which you retain in your records. All discharges from this facility and actions or reports relating thereto shall be in accordance with the terms and conditions of the original permit.

The WPDES permit program has been approved by the Administrator of the U.S. Environmental Protection Agency pursuant to Section 402(b) of the Federal Water Pollution Control Act Amendments of 1972 (33 U.S.C. Section 1342(b)). Therefore, this permit is subject to enforcement

under Section 147.21 and 147.29, Wisconsin Statutes and Section 309 of the Federal Act (33 U.S.C. Section 1319).

/s/ Oliver D. Williams
Oliver D. Williams
Acting Administrator
Division of Environmental Standards

Dated January 9, 1975

cc: U.S. Environmental Protection Agency
Attn: Permits Branch
Southeastern District

SPECIAL CONDITIONS

D. Beginning January 1, 1975 the arithmetic mean of the values for effluent samples of 5-day BOD and suspended solids collected in a reporting period shall not exceed 15 percent of the arithmetic mean of the values for influent samples collected at approximately the same time during the same period (85 percent removal).

E. Sample Collection Locations

1. Influent samples shall be taken at a point upstream from the introduction of any recycled flows. Influent samples shall be analyzed for BOD, suspended solids, and total phosphorus as a minimum. Influent samples shall be collected on the same frequency and with the same sample type as the effluent.

2. Effluent samples shall be taken at a point following disinfection. Effluent samples shall be analyzed for BOD, suspended solids, pH, fecal coliform, total phosphorus, total residual chlorine, and free available chlorine as a minimum, in accordance with the sampling frequency and sample type contained in Part II, paragraphs A, B and C.

Plaintiff's Exhibit 64

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES
Box 450—Madison, Wisconsin 53701
L. P. Voight, Secretary

In Reply Refer to: 3420

Certified Mail
Return Receipt Requested

Mr. Herbert A. Goetsch
Commissioner of Public Works
City of Milwaukee
841 North Broadway—Room 516
Milwaukee, Wisconsin 53202

Re: WPDES Permit No. WI-0026875

Dear. Mr. Goetsch:

Your application WI-0026875 for a Wisconsin Pollutant Discharge Elimination System (WPDES) Permit has been processed in accordance with Section 147.02 and 147.025, Wisconsin Statutes.

The enclosed WPDES permit covers the discharges from the facility located at City of Milwaukee Sanitary Sewer crossovers, combined sewer crossovers, and combined sewer overflows into Milwaukee River, Kinnickinnic River, Menomonee River, South Menomonee Canal-Branch of Menomonee River, Burnham's Canal-Branch of Menomonee River and Lake Michigan. All discharges from this facility and actions or reports relating thereto shall be in accordance with the terms and conditions of this permit.

The WPDES permit program has been approved by the Administrator of the U.S. Environmental Protection Agency pursuant to Section 402(b) of the Federal Water Pollution Control Act Amendments of 1972 (33 U.S.C. Section

1342(b)). The terms and conditions of this permit are accordingly subject to enforcement under Section 147.21 and 147.29, Wisconsin Statutes and Section 309 of the Federal Act (33 U.S.C. Section 1319).

/s/ OLIVER D. WILLIAMS
Oliver D. Williams
Acting Administrator
Division of Environmental Standards

Dated December 18, 1974

Enclosures
Permit
Reporting Forms

cc: U.S. Environmental Protection Agency
ATTN: Permits Branch
Southeast District

Part II, Page 1 of 7
Wisconsin Permit No. WI-0026875

SPECIAL CONDITIONS

A. Sanitary Sewer Crossovers (Gravity) and Electrically Operated Relief Pumps—Discharge Serial Number 001 through 089.

The City of Milwaukee is required to initiate a program leading to the elimination of the sanitary sewer crossovers (gravity) and the electrically operated relief pumps at discharge points 001 through 089 (as identified below) to assure attainment of all applicable Water Quality Standards.

1. On or before December 31, 1975, the City shall submit to the Wisconsin Department of Natural Resources a plan for the elimination of discharge points 001 through 089. Such plan shall include alternative engineering solutions for the elimination of each discharge point, a recommended solution for the elimination of each discharge point, an estimate of cost for the elimination of each discharge point and a time schedule for the elimination of each discharge point. If it is determined by the Department that the plan is incomplete or inadequate, the plan may be returned to the City with the reasons therefore, following which the plan shall be modified by the City and resubmitted within 60 days. After acceptance by the Department of an adequate plan, this permit may be modified to incorporate the specific provisions and time schedules contained in the plan.

2. On or before March 31, 1975, the City shall submit to the Department a listing of discharge 001 through 089 which identifies which of the discharges take place under normal dry weather conditions and which take place only under wet weather conditions.

3. On or before June 30, 1975, the City shall complete "Attachment A" for each discharge 001 through 089, and submit the completed forms to the Department.

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

NOTICE OF FINAL DETERMINATION TO ISSUE A WISCONSIN POLLUTANT DISCHARGE ELIMINATION SYSTEM (WPDES) PERMIT

Number of Notice of Final Determination: 4WM-0171B

Application Number: WI-0026875

Name and Address of Applicant:

City of Milwaukee
841 North Broadway—Room 516
Milwaukee, Wisconsin 53202

Notice of Final Determination Issued On: December 18, 1974

Permit Number: WI-0026875

Name and Address of Facility Where Discharge Occurs:

City of Milwaukee Sanitary Sewer crossovers, combined sewer crossovers and combined sewer overflows

Public Informational Hearing Held On: October 2, 1974

Date of Issuance and Effectiveness of the Permit:

December 18, 1974

Date of Expiration of the Issued Permit: June 30, 1977

Activities of Operations Resulting in Discharge: Existing discharge of untreated wastewater from sanitary sewer crossovers, combined sewer crossovers and combined sewer overflows.

4. On or before September 30, 1976, the City shall prepare and submit to the Department an Infiltration/Inflow Analysis for the separate sanitary sewer system. The Analysis shall be based on the Federal Guidelines for Sewer System Evaluation, March, 1974, EPA 520/9-74-018. On or before March 31, 1975, the City shall submit to the Department a plan of study for conducting the Infiltration/Inflow Analysis; such plan of study to include a time schedule for the accomplishment of specific tasks. Based on the results of the Analysis, a more detailed sewer system evaluation survey may be required.

5. On or before March 31, 1975, the City shall identify to the Department 10 discharge points (chosen from 001 through 089) which are considered by the City to have the most significant impact on water quality. Following concurrence by the Department, the City shall by December 31, 1975, install equipment to continuously measure all flows discharged from the 10 selected discharges and shall install equipment to adequately sample the flow discharged. Beginning on March 31, 1976, and every three months thereafter until the discharges are eliminated, the City shall submit a report to the Department containing data on the date of discharge, volume of discharge and sample analysis for each discharge. Each sample shall be analyzed for BOD, Suspended Solids, pH, Fecal Coliform and any other parameter that the Department may require.

Serial No.	Location
001	N. 25th Street and W. Hope Avenue
002	N. 30th Street and W. Hope Avenue
003	N. 31st Street (Ext.) and W. Hope Avenue (Ext.)

Receiving Water: Milwaukee River, Kinnickinnic River, Menomonee River, South Menomonee Canal-Branch of Menomonee River, Burnham's Canal-Branch of Menomonee River and Lake Michigan.

Following a public informational hearing, the above named applicant has been issued a WPDES permit by the Department to discharge into the above named receiving water. The Department has issued this WPDES permit pursuant to the authority of Section 147.02, Wisconsin Statutes.

A summary of the significant changes which have been made in the terms and conditions set forth in the draft permit is as follows:

1. The City must submit a plan by December 31, 1975 for eliminating its gravity sanitary sewer crossovers and electrically operated relief pumps.

2. By March 31, 1975, the City must identify which of its discharges take place under normal dry weather conditions.

3. By March 31, 1975 the City must identify to the Department 25 discharge points which are considered by the City to have the most significant impact on water quality. The City will subsequently be required to monitor these points for flow, BOD_5, Suspended Solids, pH, Fecal Coliform and any other parameter that the Department may require.

4. The City is to cooperate with and assist the Sewerage Commission of the City of Milwaukee in the conduct and completion of the facilities planning as provided in Treatment Works Grant C550772-01. The facilities planning elements include a feasibility study, cost-effectiveness analysis and environmental assessment for elimination or control of the discharges from the combined sewers.

As provided by Section 147.20, Wisconsin Statutes, persons desiring further adjudicative review of this final determination to issue this WPDES permit may request a public adjudicatory hearing within 60 days of the date of issuance of this final determination. Such requests shall be made in

conformance with Section 147.20, Wisconsin Statutes, and Chapter NR 3, Wisconsin Administrative Code. Further information regarding the conduct and nature of public adjudicatory hearings may be obtained by contacting the Department of Natural Resources, WPDES Permit Section.

The application, the proposed permit including effluent limitations and special conditions, and other information are on file and may be inspected and copied in Pyare Building, 4610 University Avenue, Madison, Wisconsin between the hours of 9:00 a.m. and 3:30 p.m., Monday through Friday, holidays excepted. Comments as received will be made a part of that file.

Copies of the information in the WPDES file for this applicant may be obtained by calling 608-266-3221 or by writing to the Department, WPDES Permit Section, Box 450, Madison, Wisconsin 53701. Reasonable costs will be charged for requests for copies of information other than the public notices and fact sheets.

Permit No. WI-0026875
Application No. WI-0026875

PERMIT TO DISCHARGE UNDER THE WISCONSIN POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of Chapter 147, Wisconsin Statutes,

THE CITY OF MILWAUKEE

is permitted to discharge from ITS SANITARY SEWER CROSSOVER, COMBINED SEWER CROSSOVERS, AND COMBINED SEWER OVERFLOWS

to MILWAUKEE RIVER, KINNICKINNIC RIVER, MENOMONEE RIVER, SOUTH MENOMONEE CANAL, BURNHAM'S CANAL AND LAKE MICHIGAN

in accordance with the effluent limitations, monitoring requirements and other conditions set forth in Parts I and II hereof.

This permit shall become effective on the date of signature.

This permit to discharge shall expire at midnight, June 30, 1977.

Permittee shall not discharge after the date of expiration. If the permittee wishes to continue to discharge after this expiration date he shall file an application for reissuance of his permit in accordance with the requirements of Chapter NR 200, Wisconsin Administrative Code, at least 180 days prior to this expiration date.

State of Wisconsin Department of Natural Resources
For the Secretary

By /s/ OLIVER D. WILLIAMS
Oliver D. Williams
Acting Administrator
Division of Environmental Standards

Dated this 18th day of December, 1974

GENERAL CONDITIONS

1. *Compliance*

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of the permit.

2. *Adverse Impact*

The permittee shall take all reasonable steps to minimize any adverse impact on waters of the State resulting from noncompliance with any effluent limitations specified in this permit, including such special or additional monitoring as may be required by the Department or may be necessary to determine the nature and impact of the noncomplying discharge.

3. *Removed Substances*

Solids, sludges, filter backwash or other pollutants removed from or resulting from treatment or control of wastewaters or intake waters shall be stored and disposed of in a manner such as to prevent any pollutant from such materials from entering the waters of the State. Land disposal of treatment plant solids and sludges shall be either at a site or operation licensed by the Department under Chapter NR 151,Wisconsin Administrative Code, or in accordance with a sludge disposal plan approved by the Department.

4. *Right of Entry*

The permittee shall allow authorized representatives of the Department of Natural Resources, and the Administrator of the United States Environmental Protection

Agency or his authorized representatives, upon the presentation of credentials:

a. To enter upon the permittee's premises where an effluent source is located or in which any records are required to be kept under the terms and conditions of this permit; and

b. At reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit; to inspect any monitoring equipment or monitoring method required in this permit; and to sample any wastewaters.

5. *Permit Modification*

After notice and opportunity for a hearing as provided in Section 147.03, Wisconsin Statutes, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to, the following:

a. Violation of any terms or conditions of this permit;

b. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or

c. A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge.

6. *Toxic Pollutants*

Nothing in this permit shall be construed to authorize the discharge of any toxic pollutant or combination of pollutants in amounts or concentrations which exceed any applicable toxic effluent standard or prohibition, including any schedule of compliance specified in any such effluent standard or prohibition, promulgated under Section 147.07 (1), Wisconsin Statutes.

If a toxic effluent standard or prohibition, including any schedule of compliance specified in such effluent standard or prohibition, is promulgated under Section 147.01(1), Wisconsin Statutes, for a toxic pollutant or combination of pollutants which is present in the discharge and such standard or prohibition is more stringent than any limitation for such pollutant in this permit, this permit shall be revised or modified in accordance with the toxic effluent standard or prohibition.

7. *Civil and Criminal Liability*

Except as provided in permit conditions on "Bypassing" (Part I, 23) and "Power Failures" (Part I, 24), nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties under Section 147.21, Wisconsin Statutes, for noncompliance with the terms and conditions of this permit.

8. *Oil and Hazardous Substance Liability*

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Federal Water Pollution Control Act (33 U.S.C. Section 1321).

9. *State Laws*

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any other applicable State law or regulation.

10. *Property Rights*

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private

property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

11. *Severability*

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

12. *Schedule of Compliance Progress Reports*

No later than 14 calendar days following a date identified in any schedule of compliance in Part II, the permittee shall submit either a report of progress or, in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance. In the latter case, the notice shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirements.

13. *Test Procedures*

Test procedures used for the analysis of pollutants shall be those listed in Chapter NR 219, Wisconsin Administrative Code, or an alternate method authorized in Part II.

14. *Recording of Results*

For each measurement of sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

a. The exact place, date, and time of sampling;

b. The dates the analyses were performed;

c. The person(s) who performed the analyses;

d. The analytical techniques or methods used; and

e. The results of all required analyses.

15. *Additional Monitoring by Permittee*

If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified in Chapter NR 219, the results of such monitoring shall be reported to the Department on a quarterly basis.

16. *Records Retention*

All records and information resulting from the monitoring activities required by this permit including all records of analysis performed and calibration and maintenance of instrumentation and recordings from continuous monitoring instrumentation shall be retained for a minimum of three (3) years, or longer if requested by the Department of Natural Resources.

17. *Construction of Onshore or Offshore Structures*

This permit does not authorize or approve the construction of any onshore or offshore physical structure of facilities or the undertaking of any work in any navigable waters.

18. *Confidential Information*

Except for data determined to be confidential under Section 147.08(2)(c), Wisconsin Statutes, all monitoring reports required by this permit shall be available for public inspection at the headquarters of U.S. EPA Region V and the Department of Natural Resources. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in Section 147.21, Wisconsin Statutes.

19. *Transfer of Control of Operation*

In the event of a transfer of control of operation of the facility from which the permitted discharges emanate to a person not named on page one (1) of this permit, the permittee prior to such transfer shall notify his successor by letter that this permit is not transferable and that prior to any discharge after such transfer, a new WPDES permit must be obtained. A copy of this letter shall be forwarded to the Department of Natural Resources, WPDES Permit Section, Box 450, Madison, Wisconsin 53701.

20. *Change in Discharge*

Facility modifications, additions, and/or expansions that increase the plant capacity must be reported to the Department and this permit then modified or reissued to reflect such changes. Any anticipated change in the facility discharge, including any new significant industrial discharge or significant changes in the quantity or quality of existing industrial discharges of pollutants must be reported to the Department. Modifications to the permit may then be made to reflect any necessary changes in permit conditions, including any necessary effluent limitations for any pollutants not identified and limited herein. In no case are any new connections, increased flows, or significant changes in influent quality permitted that will cause violation of the effluent limitations specified herein.

21. *Noncompliance Notification*

If for any reason the permittee does not comply with or will be unable to comply with any effluent limitation specified in this permit, or should any unusual or extraordinary discharge of wastes occur from the facilities herein permitted, the permittee shall provide the Department in writ-

ing within five days of such occurrence with the following information:

a. A description of the noncomplying discharge including its impact upon the receiving waters.

b. Cause of noncompliance.

c. Anticipated time the condition of noncompliance is expected to continue, or if such condition has been corrected, the duration of the period of noncompliance.

d. Steps taken by the permittee to reduce and eliminate the noncomplying discharge.

e. Steps to be taken by the permittee to prevent recurrence of the condition of noncompliance.

22. *Facility Operation and Quality Control*

All waste collection, control, treatment and disposal facilities shall be operated in a manner consistent with the following:

a. At all times, all facilities shall be operated as efficiently as possible and in a manner which will minimize discharges of excessive pollutants.

b. Maintenance of the sewer system that results in discharge of untreated wastes to surface waters shall be scheduled during non-critical water quality periods and shall be carried out in a manner approved by the Department.

23. *Power Failures*

The permittee is responsible for maintaining adequate safeguards to prevent the discharge of untreated or inadequately treated wastes during electrical power failure either by means of alternate power sources, standby generators

or retention of inadequately treated effluent. Should the treatment works not have the above capabilities at the time of permit issuance, the permittee must furnish within 120 days to the Department, for approval, plans for such facilities and an implementation schedule for their installation.

24. *Pretreatment*

The permittee shall require any industrial user of the sewer collection system to provide pretreatment as required under Section 147.07(2), Wisconsin Statutes, to provide any records, reports or information related to any pretreatment or new source performance standards. Any industrial user of the sewer collection system shall be required by the permittee to prepare and submit to the WPDES Permit Section periodic notices of progress toward full compliance with the requirements of Section 147.07(2), Wisconsin Statutes. Such notices shall be submitted at intervals not to exceed nine (9) months or as required elsewhere in this permit.

25. *Prohibited Wastes*

Under no circumstances shall the permittee allow introduction into the sewer collection system wastes prohibited by NR 211.10, Wisconsin Administrative Code, which include those

a. Which create a fire or explosion hazard in the treatment works,

b. Which will cause corrosive structural damage to treatment works,

c. Solid or viscous substances in amounts which cause obstructions to the flow in sewers or interference with the proper operation of the treatment works,

d. Wastewaters at a flow rate and/or pollutant discharge rate which is excessive over relatively short time periods so as to cause a loss of treatment efficiency,

e. New wastes or increased volumes or quantities of wastes from major contributing industries in such volumes or quantities as to overload the treatment works or cause a loss of treatment efficiency.

26. *Definition Terms*

(i) For those terms used in Parts I and II which are defined in Section 147.015, Wisconsin Statutes, the meanings of that Section shall apply.

(ii) As used in Daily Effluent Limitations, Part II:

(1) "Average" means the arithmetic mean of daily monitoring test results obtained during a calendar month for the given parameter; that is the total of such daily results, in pounds per day, milligrams per

liter, or other appropriate unit divided by the number of days for which results are totaled. For example, if a facility operates or discharges and monitors 30 days during a month the daily average is the sum of daily values in pounds per day, milligrams per liter, or other appropriate unit divided by 30 for each parameter, but if one day's result is missing for any parameter the divisor in that case is 29.

(2) "Maximum" means the highest daily monitoring test result, in pounds per day, milligrams per liter, or other appropriate unit during the calendar month for the given parameter.

(3) "Minimum" means the lowest daily monitoring test result, in the appropriate unit, during the calendar month for the given parameter.

(4) The "average" for fecal coliform bacteria shall be the geometric mean of the samples collected in a reported period.

Serial No.	Location
004	N. 31st Street and W. Villard Avenue (12″ diameter crossover)
005	N. 31st Street and W. Villard Avenue (8″ diameter crossover)
006	N. 41st Street and W. Congress Street
007	N. 47th Street and W. Concordia Avenue
008	N. 47th Street and W. Congress Street
009	N. 49th Street and W. Concordia Avenue
010	N. 68th Street and W. Center Street
011	N. 20th Street at W. Fairmont Avenue
012	S. 3rd Street at W. Saveland Avenue
013	N. 76th Street, 200 feet north of Hadley Street
014	N. 79th Street and W. Locust Street
015	W. Capitol Drive (N/S) and N. 31st Street
016	W. Capitol Drive (S/S) and N. 31st Street
017	N. Sherman Boulevard and W. Fond du Lac Avenue
018	S. Whithall Avenue and E. Howard Avenue
019	N. 36th Street between W. Carmen Avenue and W. Florist Avenue
020	E. Howard Avenue at S. Pine Avenue
021	W. Center Street at N. 86th Street
022	N. 35th Street, 40 feet north of W. Oriole Drive
023	S. 35th Street at W. Lakefield Drive
024	W. Center Street at N. 88th Street
025	W. Ruskin Street at S. 38th Street
026	W. Silver Spring Drive at N. 38th Street
027	W. Silver Spring Drive at N. 37th Street
028	W. Silver Spring Drive at N. 36th Street
029	W. Silver Spring Drive at N. 35th Street
030	W. Silver Spring Drive at N. 27th Street
031	N. 89th Street at W. Townsend Street
032	N. 90th Street at W. Townsend Street
033	W. Dickinson Street and S. 62nd Street
034	W. Hope Avenue and N. 47th Street

Serial No.	Location
035	W. Silver Spring Drive and N. 39th Street
036	W. Silver Spring Drive and N. 41st Street
037	W. Stevenson Street and N. 71st Street
038	W. Mt. Vernon Avenue and N. 69th Street
039	W. Morgan Avenue at S. 57th Street
040	W. Hadley Street at N. 80th Street
041	W. Mt. Vernon Avenue at 75 feet east of N. 91st Street
042	N. 41st Street and Congress Street
043	N. 66th Street ½ block between W. Congress Street and W. Ruby Avenue
044	N. 94th Street and W. Townsend Street
045	N. 95th Street and W. Metcalf Pl.
046	E. Armour Avenue 69 feet west of S. Austin Street
047	N. 89th Street and W. Center Street
048	N. 87th Street and W. Center Street
049	N. 44th Street 285 feet south of W. Burleigh Street
050	N. 53rd Street at W. Glendale Avenue
051	N. 53rd Street at W. Courtland Avenue (Ext.)
052	S. Austin Street at W. Dakota Street
053	N. 27th Street 404 feet south of W. Hope Avenue
054	E. Ohio Street and S. Quincy Avenue

055	W. Lawn Avenue and N. Milwaukee River Parkway
056	N. Milwaukee River Parkway and vacated W. Wilson Drive
057	W. Fairmount Avenue and N. 19th Place
058	W. Fairmount Avenue and N. Green Bay Road
059	S. 43rd Street and W. Morgan Avenue
060	N. 20th Street at W. Hampton Avenue (North Side)

Serial No.	Location
061	N. 20th Street at W. Hampton Avenue (South Side)
062	N. 19th Place at W. Fairmount Avenue
063	N. 49th Street at W. Luscher Avenue
064	N. 60th Street at W. Custer Avenue
065	5384 N. 60th Street
066	N. 61st Street at W. Lawn Avenue
067	5373 N. 60th Street
068	5344 N. 60th Street
069	N. 63rd Street at W. Fairmount Avenue
070	N. 64th Street at W. Stark Street
071	5030 N. 55th Street
072	N. 66th Street at W. Ruby Avenue
073	N. 96th Street at W. Auer Avenue
074	N. 99th Street at W. Concordia Avenue
075	S. 46th Street at W. Cleveland Avenue
076	Mid-block W. Lincoln Avenue between S. 36th Street and S. 37th Street
077	N. Milwaukee River Parkway at W. Lawn Avenue
078	N. Milwaukee River Parkway, north of W. Lawn Avenue
079	N. 58th Street at W. Sheridan Avenue
080	S. 72nd Street at W. Honey Creek Parkway
081	S. 77th Street at W. Oklahoma Avenue
082	3253 S. 57th Street
083	S. 54th Street at W. Midland Drive
084	92nd Street at W. Howard Avenue
085	S. Howell Avenue at W. Ramsey Avenue
086	S. Howell Avenue at E. Edgerton Avenue
087	S. Burrell Street at E. Van Norman Avenue
088	W. Monrovia Avenue at W. Crossfield Avenue
089	S. 94th Street at W. Howard Avenue
089a	W. Olive Street at 435′ S.E. at W. Roosevelt Drive
089b	N. 24th Street and W. Hope Avenue
089d	

B. Combined Sewer Crossovers and Overflows—Discharge Serial Number 090 through 213.

The City of Milwaukee is required to initiate a program leading to the attainment of control of overflows from the City's combined sewer system at discharge points 090 through 213 (as identified below), to assure attainment of all applicable Water Quality Standards.

1. The City is to cooperate with and assist the Sewerage Commission of the City of Milwaukee in the conduct and completion of the facilities planning as provided in Treatment Works Grant 0550772-01. The facilities planning elements include a feasibility study, cost-effectiveness analysis and environmental assessment for elimination or control of the discharges from the combined sewers.

2. Beginning on March 31, 1975 and continuing every three months thereafter until completion of the facilities planning, the City shall submit progress reports to the Department of Natural Resources, WPDES Permit Section.

3. On or before March 31, 1975, the City shall submit to the Department a listing of discharges 090 through 213 which identifies which of the discharges take place under normal dry weather conditions and which takes place only under wet weather conditions.

4. On or before June 30, 1975, the City shall complete "Attachment A" for each discharge 090 through 213, and submit the completed forms to the Department.

5. On or before March 31, 1975, the City shall identify to the Department 15 discharge points (chosen from 090 through 213) which are considered by the City to have the most significant impact on water quality. Following concurrence by the Department, the City shall

by Department 31, 1975, install equipment to continuously measure all flows discharged from the 15 selected discharges and shall install equipment to adequately sample the flow discharged. Beginning March 31, 1976, and every three months thereafter until the discharges are eliminated or controlled, the City shall submit a report to the Department containing data on the date of discharge, volume of discharge and sample analysis for each discharge. Each sample shall be analyzed for BOD, Suspended Solids, pH, Fecal Coliform and any other parameter that the Department may require. In the event the facilities planning referred to in (a) above identifies more than 15 discharges which will be monitored, the City shall submit, on a quarterly basis, information on all discharges monitored beginning at the close of the quarter during which the monitoring is initiated.

Combined Sewer Crossovers—Discharge Serial Numbers 090 through 100 inclusive:

Serial No.	Location
090	N. 26th Street and W. Vienna Avenue
091	N. 37th Street 145 feet north of W. Mt. Vernon Avenue
092	N. 38th Street and W. Mt. Vernon Avenue
093	N. 46th Street and W. State Street
094	E. Meinecke Avenue and N. Gordon Place
095	W. Hilda Place and S. 38th Street

096	N. Sherman Boulevard at W. Burleigh Street
097	E. Lincoln Avenue at S. Burrell Street
098	E. Lincoln Avenue 150 feet west of S. Greeley Street

Serial No.	Location
099	E. Lincoln Avenue 450 feet west of S. Greeley Street
100	N. 37th Street 11 feet north of W. Mt. Vernon Avenue

Combined Sewer Overflows to the Milwaukee River—

Discharge Serial Numbers 101 through 164 inclusive:

101	E. Capitol Drive
102	E. Keefe Avenue
103	E. Edgewood Avenue
104	E. Auer Avenue (36″)
105	E. Auer Avenue (84″)
106	E. Hampshire Street
107	E. Burleigh Street
108	E. Chambers Street
109	E. Locust Street
110	E. Park Place
111	E. Bradford Avenue
112	E. Boylston Street
113	E. Tunnel Place
114	N. Pulaski Street
115	N. Humboldt Avenue
116	Point 350 feet west of N. Humboldt Avenue
117	Point 800 feet west of N. Humboldt Avenue
118	N. Marshall Street
119	N. Holton Street
120	E. Brady Street
121	North of E. Walnut Street (96″)
122	E. Walnut Street
123	E. Pleasant Street
124	North of Cherry Street
125	W. Cherry Street (90″)
126	E. Lyon Street
127	E. Ogden Avenue
128	W. McKinley Avenue

Serial No.	Location
129	W. Juneau Avenue
130	E. Juneau Avenue
131	W. Highland Avenue
132	E. Highland Avenue
133	W. State Street
134	E. State Street
135	W. Kilbourn Avenue (36″)
136	W. Kilbourn Avenue (4′-6″ x 6′)
137	E. Kilbourn Avenue
138	North of W. Wells Street (30″)
139	W. Wells Street (48″)
140	E. Wells Street
141	North of W. Wisconsin Avenue (18″ x 30″)
142	W. Wisconsin Avenue (24″)
143	E. Wisconsin Avenue
144	North of W. Michigan Street (30″)

145	W. Michigan Street (54″)
146	E. Michigan Street
147	North of W. Clybourn Street (24″ x 26″)
148	W. Clybourn Street (48″)
149	E. Clybourn Street
150	North of W. St. Paul Avenue (30″)
151	W. St. Paul Avenue
152	E. St. Paul Avenue
153	E. Buffalo Street
154	E. Chicago Street
155	S. 1st Street
156	S. Water Street
157	E. Pillsburgh Avenue
158	N. Broadway
159	South of E. Oregon Street
160	E. Florida Street

Serial No.	Location
161	E. Polk Street
162	E. Harbor Place
163	E. Bruce Street
164	North of W. Juneau Avenue (36″)

Combined Sewer Overflows to the Kinnickinnic River—Discharge Serial Numbers 165 through 186 inclusive:

165	E. National Avenue
166	E. Walker Street
167	South of E. Walker Street
168	South of E. Washington Street
169	E. Greenfield Avenue
170	S. Kinnickinnic Avenue (30″)
171	S. Kinnickinnic Avenue (60″)
172	S. 1st Street N. (42″)
173	S. 1st Street S. (42″)
174	S. 2nd Street
175	W. Rogers Street
176	W. Becher Street (12′ x 6′)
177	W. Becher Street (96″)
178	W. Lincoln Avenue (30″)
179	W. Lincoln Avenue (48″)
180	S. Chase Avenue (18″)
181	S. Chase Avenue (10′ x 5′)
182	W. Cleveland Avenue (72″)
183	W. Cleveland Avenue (84″)
184	S. 8th Street
185	S. 14th Street
186	S. 27th Street

Combined Sewer Overflows to the Menomonee River—Discharge Serial Numbers 187 through 203 inclusive:

187	S. 2nd Street

Serial No.	Location
188	West of N. 8th Street
189	N. Muskego Avenue (30″)
190	N. Muskego Avenue (54″)
191	N. 15th Street (D61-7′ x 4′)
192	N. 15th Street (7′ x 4′)
193	N. 17th Street
194	N. 25th Street
195	N. 26th Street
196	S. 27th Street (48″)
197	S. 27th Street N. (48″)
198	S. 35th Street
199	W. Wisconsin Avenue (24″E)
200	W. Wisconsin Avenue (24″)
201	N. 43rd Street
202	N. 45th Street
203	N. Hawley Road
203a	W. Congress Street (Ext'd) 85′ E. of N. 35th Street

Combined Sewer Overflows to the South Menomonee Canal-Branch of Menomonee River—Discharge Serial Numbers 204 and 205:

204	S. 4th Street
205	S. 6th Street

Combined Sewer Overflows to Burnham's Canal-Branch of Menomonee River—Discharge Serial Numbers 206 through 211 inclusive:

Serial No.	Location
206	S. 9th Street (36″)
207	S. 9th Street (78″)

208 S. 11th Street
209 S. 13th Street (36″)
210 S. 13th Street (60″)
211 S. Muskego Avenue

Combined Sewer Overflows to Lake Michigan—Discharge Serial Numbers 212 and 213:

212 E. Bay Street
213 E. Russell Avenue

"ATTACHMENT A"

1. Discharge Serial Number:
2. Discharge Location: _____
3. Name of Receiving Water: _____
4. Occurrence (check when discharge occurs)

   Wet weather _____Yes, _____No
   Dry weather _____Yes, _____No

5. Frequency (Give the actual or approximate number of incidents per year)

   Wet weather _____times per year
   Dry weather _____times per year

6. Duration (Give the average duration per incident in hours)

   Wet weather _____hours
   Dry weather _____hours

7. Volume (Give the average volume per incident in thousand gallons)

   Wet weather _____thousand gallons per incident
   Dry weather _____thousand gallons per incident

8. Reason (Give brief reason or justification for discharge)

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES
Box 450—Madison, Wisconsin 53701
L. P. Voight, Secretary

In Reply Refer to: 3420

Certified Mail
Return Receipt Requested

Mr. Herbert A. Goetsch
Commissioner of Public Works
City of Milwaukee
841 North Broadway—Room 516
Milwaukee, Wisconsin 53202

RE: Modification of WPDES Permit No. WI-0026875

Dear Mr. Goetsch:

The request for modification of Wisconsin Pollutant Discharge Elimination System (WPDES) Permit No. WI-0026875 initiated by Mr. Edwin Laszewski on March 17, 1975 has been processed in accordance with Section 147.03, Wisconsin Statutes.

The page which is attached, namely, page 7a of 7 of Part II is an addition to the original permit issued on December 18, 1974. Please replace the original page with this attached modified page in all copies of the permit which you retain in your records. All discharges from this facility and actions or reports relating thereto shall be in accordance with the terms and conditions of the original permit, as modified.

The WPDES permit program has been approved by the Administrator of the U.S. Environmental Protection Agency pursuant to Section 402(b) of the Federal Water Pollution Control Act Amendments of 1972 (33 U.S.C. Section 1342(b)). The modified permit is accordingly subject to

enforcement under Section 147.21 and 147.29, Wisconsin Statutes and Section 309 of the Federal Act (33 U.S.C. Section 1319).

/s/ ANDREW C. DAMON
Andrew C. Damon
Acting Administrator
Division of Enforcement

Dated July 30, 1975

Enclosures
Permit
Reporting Forms

cc: U.S. Environmental Protection Agency
ATTN: Permits Branch
Southeast District

APPENDIX I

The following sanitary sewer crossovers will be eliminated from the permit:

Serial No.	Location
005	North 31st Street and West Villard Avenue
007	North 47th Street and West Concordia Avenue
008	North 47th Street and West Congress Street
009	North 49th Street and West Concordia Avenue
012	South 3rd Street and West Saveland Avenue

The following combined sewer crossover will be eliminated from the permit:

Serial No.	Location
100	N. 37th St. 11 feet north of W. Mt. Vernon

The following combined sewer overflows will be eliminated from the permit:

Serial No.	Location
135	West Kilbourn Avenue (36")
164	North of West Juneau Avenue (36")
188	West of N. 8th Street
162	East Harbor Place

The following sanitary sewer crossovers will be added to the permit:

Serial No.	Location
089a	West Olive Street 435 St. SE of W. Roosevelt Drive
089b	North 24th Street and West Hope Avenue

The following combined sewer overflow shall be added to the permit:

Serial No.	Location
203a	W. Congress St. (extended) 85 ft. east of North 35th St.

APPENDIX II

The following combined sewer overflows are eliminated from the permit.

Serial Number	Location
116	Point 350 feet west of N. Humboldt Avenue
117	Point 800 feet west of N. Humboldt Avenue

The following combined sewer overflows are eliminated from the permit.

Serial Number	Location
104	E. Aver Avenue (36″)
144	North of W. Michigan Street (30″)

The following sanitary sewer crossover is added to the permit.

Serial Number	Location
089c	N. 89th Street and W. Center Street (southerlyh [sic])

The following combined sewer overflow is added to the permit.

Serial Number	Location
203b	N. 9th Street (extended—96″)

Defendants' Exhibit 1311

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

Case No. 72-C-1253

PEOPLE OF THE STATE OF ILLINOIS, ex rel. WILLIAM J. SCOTT, Attorney General of the State of Illinois, *Plaintiff*,
PEOPLE OF THE STATE OF MICHIGAN,

vs.

CITY OF MILWAUKEE, WISCONSIN; CITY OF KENOSHA, WISCONSIN; CITY OF RACINE, WISCONSIN; CITY OF SOUTH MILWAUKEE, WISCONSIN; THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE, and THE METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE,
Defendants.

MOTION TO DISMISS

The Sewerage Commission of the City of Milwaukee and the Metropolitan Sewerage Commission of the County of Milwaukee, defendants herein, by their attorneys, Schroeder, Gedlen, Riester & Moerke, by Ewald L. Moerke, Jr., and the City of Milwaukee by James B. Brennan, City Attorney, represented by Michael J. McCabe, Assistant City Attorney, hereby moves the Court to dismiss the above-captioned action now on trial for the reasons set forth in the accompanying Affidavit.

SCHROEDER, GEDLEN, RIESTER & MOERKE
By: /s/ EWALD L. MOERKE, JR.
Ewald L. Moerke, Jr.
Attorneys for Defendants,
Sewerage Commission of the City of Milwaukee and Metropolitan Sewerage Commission of the County of Milwaukee

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UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

Case No. 72-C-1253

PEOPLE OF THE STATE OF ILLINOIS, ex rel, WILLIAM J. SCOTT, Attorney General of the State of Illinois, *Plaintiff*,
PEOPLE OF THE STATE OF MICHIGAN,

VS.

CITY OF MILWAUKEE, WISCONSIN; CITY OF KENOSHA, WISCONSIN; CITY OF RACINE, WISCONSIN; CITY OF SOUTH MILWAUKEE, WISCONSIN; THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE, and THE METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE,
Defendants.

AFFIDAVIT

STATE OF WISCONSIN,)
MILWAUKEE COUNTY,) ss

Ewald L. Moerke, Jr., being first duly sworn on oath, deposes and states as follows:

1. That he is the attorney for the Sewerage Commission of the City of Milwaukee and the Metropolitan Sewerage Commission of the County of Milwaukee, defendants herein.

2. That the above-captioned action is an action commenced by the plaintiffs grounded on the Federal Common Law of Nuisance as described and set forth in *Illinois* v. *City of Milwaukee* (1972) 406 U.S. 91.

3. On January 1, 1975 the Department of Natural Resources of the State of Wisconsin issued discharge permits to the Sewerage Commission of the City of Milwaukee for the operation of the Jones Island Waste Water Treatment Plant and the South Shore Waste Water Treatment Plant containing effluent limitations and other terms and conditions and restrictions on the operation of said plants.

4. On or about the middle of July, 1976, the Sewerage Commission of the City of Milwaukee commenced an action in the Circuit Court of Dane County, Wisconsin challenging the permits issued by the Department of Natural Resources. Shortly thereafter, the Department of Natural Resources, through the Attorney General of the State of Wisconsin, counter-claimed in said action alleging the validity of the permits and seeking a money judgment from the Sewerage Commission of the City of Milwaukee for forfeitures for violations of the terms and conditions of said permits.

5. Negotiations have taken place between the Commissions on one hand and the Department of Natural Resources and the Attorney General's office on the other hand with respect to the settlement of such litigation, and on May 25, 1977 a Stipulation and Agreement was finally signed and approved by the Honorable William C. Sachtjen, one of the judges of the Circuit Court of Dane County and at such proceedings the Metropolitan Sewerage Commission of the County of Milwaukee was made a party plaintiff to said action. At the same time, Judgment was entered by the Court approving the Stipulation between the parties as fair and reasonable and incorporating the Stipulation by reference in said Judgment and adopting the terms thereof as the Judgment of the Court.

6. Among other things, the Stipulation and Judgment reserves to the Court the issue of the validity of the existing permits for a future trial and determination and further provides that if such permits are valid, then the question of the amount of forfeiture, if any, will be tried to the Court.

7. The document also provides for a complete schedule of compliance, including time limitations within which certain actions are to take place and requiring the defendants to raise substantial sums of money to carry out such sched-

ule of compliance, the total of which is estimated to be approximately $700 million in terms of 1976 dollars and is estimated to exceed $1 billion at the time of completion.

8. The Stipulation and Judgment further provides that the two Commissions, defendants herein, have the obligation of supervising the correction of wet weather bypassing and overflowing at the separate sewer areas of the district and the contract areas and calls for the correction of all such situations not later than July 1, 1986, and authorizes the Commissions to bring suit against those participating municipalities for failure to comply with that requirement.

9. The Stipulation and Judgment also provides for the correction of wet weather bypassing and overflowing in the City of Milwaukee and the Village of Shorewood, consisting of approximately 27 square miles served by said storm and sanitary sewers and obligating the district to implement such program in accordance therewith.

10. Pending the improvements to the sewerage treatment plants called for in said Agreement, the Stipulation and Judgment imposes waste load restrictions and apportionment by requiring a limitation on the amount of new sewers and connections to the system which takes into consideration the improvements to be made to such plants under the schedule of compliance.

11. The Stipulation and Agreement provides for continuous supervision of the schedule of compliance by the Dane County Circuit Court by requiring the Department of Natural Resources to submit to the Court a compliance evaluation report, thus requiring continuing jurisdiction of that Court insuring compliance with the terms and conditions of the Stipulation and Judgment.

12. The Stipulation and Judgment also contains a requirement that the Department of Natural Resources reissue the present permits for the operation of the South Shore and Jones Island Waste Water Treatment facilities containing the same effluent limitations as in the current permits which permits, pursuant to law, will be for five years unless modified pursuant to the administrative rules and regulations in effect at the time of such modification. Any violations of the terms and conditions of such permits as reissued will be reviewed by the parties and by the Court once a year.

13. The Stipulation and Judgment, the continuing jurisdiction of the Dane County Circuit Court, the detailed and comprehensive schedule of compliance, the time limitations agreed to by the parties therein and the enforcement of such agreement by the imposition of forfeitures pursuant to law constitute a complete and comprehensive exhaustion and implementation of applicable provisions of Public Law 92-500 and Chapter 144 and 147 of the Wisconsin Statutes and constitute a complete program for the protection of the health of all citizens using Lake Michigan as a source of potable drinking water and for recreational purposes and is an assumption by the federal and state regulatory agencies of the protection of the Great Lakes thus making use of the doctrine of Federal Common Law of Nuisance unnecessary in that the plaintiff's rights are adequately and fully protected by the full and complete assumption of such jurisdiction.

14. Attached hereto are conformed copies of the Stipulation and an Order making the Metropolitan Sewerage Commission of the County of Milwaukee an additional plaintiff to this action and the Judgment.

15. This Affidavit is for the purpose of supporting the Motion to Dismiss to which it is attached.

/s/ Ewald L. Moerke, Jr.
Ewald L. Moerke, Jr.

Subscribed and sworn to before me this 26th day of May, 1977.

/s/ Susan K. Long
Notary Public, State of Wisconsin
My Commission expires 12-14-80.

STATE OF WISCONSIN
CIRCUIT COURT
DANE COUNTY

Case No. 152-342

THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE,
Plaintiff,

METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE, *Additional Plaintiff,*

v.

STATE OF WISCONSIN DEPARTMENT OF NATURAL RESOURCES,
Defendant.

STIPULATION

WHEREAS, the Sewerage Commission of the City of Milwaukee ("the City Commission") is charged by law with the duty of projecting planning, constructing and establishing a sewerage system for the collection, transmission and disposal of the sanitary and industrial sewage generated within the City of Milwaukee and to this end has established and maintained a system of intercepting sewers within the City and has constructed, and presently operates the Jones Island and South Shore sewage treatment plants; and,

WHEREAS, the State of Wisconsin Department of Natural Resources ("the Department") has issued to the City Commission Wisconsin Pollutant Discharge Elimination System ("WPDES") permits nos. WI-0024767 for the Jones Island treatment plant ("the Jones Island permit") and WI-0024775 for the South Shore treatment plant ("the South Shore permit"), which permits require, *inter alia,* that by December 27, 1974, the Jones Island treatment plant meet secondary and applicable water quality treatment standards and by January 1, 1975, that the South Shore treatment plant meet the same standards; and,

WHEREAS, the City Commission on July 7, 1976, sought judgment declaring that that portion of sec. NR 210.10, Wis. Admin. Code, which authorizes the Department to require secondary treatment standards to be met by publicly owned treatment works before July 1, 1977 is in excess of the Department's statutory rule-making authority and is in excess of its jurisdiction; and,

WHEREAS, in its complaint for declaratory judgment, the City Commission further sought judgment declaring that those portions of the Jones Island and South Shore permits are void *ab initio* insofar as they require secondary treatment prior to July 1, 1977; and,

WHEREAS, the Department in its answer and counterclaim in this action alleged that the federal government, by the Federal Water Pollution Control Act Amendments of 1972 ("FWPCA") is authorized to require publicly owned treatment works to meet secondary treatment standards on or before July 1, 1977, and further alleged that the Department is authorized by sec. 147.04(3)(a), Wis. Stats., and sec. NR 210.10, Wis. Admin. Code, to require publicly owned treatment works to achieve secondary treatment standards on or before July 1, 1977; and,

WHEREAS, the Department in its counterclaim of August 2, 1976, alleged that since January 1, 1975, the City Commission has violated the effluent limitations in its Jones Island and South Shore permits a total of more than sixty times; and that at the Jones Island plant these consisted of violations of effluent limitations on suspended solids, BOD_5 (5-day biochemical oxygen demand), fecal coliform and total phosphorus; and that the violations at the South Shore plant consisted of exceeding effluent limitations on suspended solids, BOD_5 and total phosphorus, and,

WHEREAS, the Metropolitan Sewerage Commission of the County of Milwaukee, ("the County Commission") is charged by law with the duty of projecting, planning, constructing and establishing a sewerage system for the collection, and transportation of sanitary and industrial sew-

age from areas outside of the City of Milwaukee but within the service area of the Metropolitan Sewerage District of the County of Milwaukee ("the District") for disposal at the Jones Island and South Shore sewage treatment plants, all subject to approval by the City Commission; and

WHEREAS, the Department alleges that such sewage generated within the service area of the City and County Commissions contribute to the overloading of the Jones Island and South Shore plants and exacerbates the inadequate waste water treatment being provided by these plants; and

WHEREAS, the Department alleges that under dry weather and wet weather conditions, bypassing and overflowing occur within the sewerage systems of the Commissions and such discharges must either be eliminated or meet secondary treatment standards by July 1, 1977; and,

WHEREAS, it is alleged by the Department that violations of treatment standards at Jones Island and South Shore, and bypass or overflow discharges within the sewerage systems will continue to occur until such time as sewerage system improvement projects are completed; and

WHEREAS, the Department demanded judgment for, among other things, a mandatory injunction requiring the Commission to take steps to bring it into compliance with the terms of its Jones Island and South Shore permits; and,

WHEREAS, the Metropolitan Sewerage District of the County of Milwaukee is a body corporate acting through the agency of the City and County Commissions and under law holds title to all property obtained by either or both Commissions; and,

WHEREAS, the parties now desire to settle the above entitled action by agreeing to a program of pollution abatement projects to be carried out in the District.

NOW, THEREFORE, THE PARTIES BY THEIR RESPECTIVE ATTORNEYS, HEREBY STIPULATE AND AGREE AS FOLLOWS:

A. Compliance Schedule and Timetable

1. Federal Funding Priorities and Timetable.

(a) The parties recognize and agree that they cannot bind the federal government nor obligate state or federal funds in advance. It is further understood that the program of funding for sewage treatment plant and sewerage system improvements set forth in this Stipulation anticipates the continued availability of federal financial assistance in the amount of seventy-five percent (75%) of eligible costs and twelve-and-one-half percent (12½%) state funding of eligible project costs for the combined sewer overflow project.

(b) Consistent with the applicable state rules and federal regulations and guidelines the Commissions shall, beginning in calendar year 1977, cause to be raised sufficient local funds to enable them to obligate available federal and state funds for necessary sewerage system improvement projects in accordance with the following minimum annual expenditure schedule:

YEAR	MINIMUM ANNUAL EXPENDITURE (1976 DOLLARS)
1977	$35.2 million
1978	40.1
1979	31.2
1980	52.5
1981	60.4
1982	51.6
1983	45.6
1984	40.2
1985	40.2
1986-1992	33.2 per year
1993	22.5

(c) The District shall plan, obligate funds and schedule improvements to accomplish the following requirements:

(1) Completion and placement in operation of the Solids Management Program at the Jones Island and South Shore plants shall be accomplished by no later than July 1, 1982;

(2) The Relief Sewers projects shall be completed by no later than July 1, 1983;

(3) The Waste Water Treatment Plant Facility Improvements projects shall be completed by no later than July 1, 1982;

(4) Consistent compliance with secondary treatment standards and the current phosphorous limitation contained in the permits of 1 mg/liter on a monthly average at both the Jones Island and South Shore treatment plants not later than July 1, 1982;

(5) Elimination of any bypassing or overflowing which occurs within the sewerage systems under dry weather by not later than July 1, 1982;

(6) The Sewer and Plant Rehabilitation projects, other than the main and intercepting sewer system rehabilitation and combined sewer overflow projects, shall be completed by no later than July 1, 1983;

(7) The New Trunk Sewers to serve District projects shall be completed by no later than July 1, 1982; and,

(8) The New Trunk Sewers to serve Contract Areas projects shall be completed by no later than July 1, 1982.

2. Local Funding Priorities and Timetable.

(a) In the event that in any calendar year, anticipated state or federal financial assistance is not available, or is available in a percentage lower than that set forth in para-

graph A 1.(a), the Commissions shall, nevertheless, raise and obligate local monies for necessary sewage treatment plant and sewerage system improvement projects in accordance with the following:

(1) The amount of local dollars to be raised and obligated by the Commissions in any one calendar year for capital improvements shall be not less than 15 million dollars (1976 dollars) in local funds;

(2) The precise amount to be raised and obligated for capital improvements in a given calendar year shall be sufficient to assure that the following requirements will be met:

(a) Completion of the solids management program projects at both South Shore and Jones Island, by not later than July 1, 1982;

(b) Completion of those wastewater treatment plant facility improvement projects necessary to achieve and maintain consistent compliance with the terms of sections (d) and (e) below by not later than July 1, 1982;

(c) Completion of the relief sewer projects by not later than July 1, 1983;

(d) Consistent compliance with secondary treatment standards and the current phosphorous limitation contained in the permits of 1 mg/liter on a monthly average at both the Jones Island and South Shore treatment plants by not later than July 1, 1982; and

(e) Elimination of any bypassing or overflowing which occurs within the sewerage systems under dry weather conditions by not later than July 1, 1982.

(3) This obligation shall commence in 1977 and shall terminate upon completion of, or compliance with, (a) through (e) above.

3. For purposes of this Stipulation, the term "1976 dollars" means the purchasing power of a dollar in the year 1976. The conversion shall be made for each year, to determine the number of dollars which must be raised to be equivalent to any 1976 dollar figure set out in this Stipulation, by utilizing Consumer Price Index data (column entitled "All Items") supplied by the U.S. Department of Labor, Bureau of Labor Statistics, for the Milwaukee Standard Metropolitan Statistical Area (SMSA) which includes Milwaukee, Ozaukee, Washington, and Waukesha Counties, in the following manner:

(a) The base year consumer price index (1976) shall be determined as the annual average of the four quarterly 1976 index figures;

(b) The annual average consumer price index derived above shall be converted to a base of 100;

(c) The percentage increase in the consumer price index ("All Items" column) for Milwaukee between 1976 and the pertinent year average annual consumer price index shall be multiplied times the dollar figure contained in the Stipulation.

4. Critical Path Analysis.

(a) By no later than June 1, 1977, the Commissions shall submit to the Department for its approval a complete and adequate critical path analysis ("CPA") of the various sewage treatment plant and sewerage system improvement projects necessary to meet applicable treatment standards. The CPA shall describe each project or project segment. It shall also identify the minimum time frames necessary for the planning, design, and construction of each project

or project segment, as well as identify a completion date for each project or project segment.

(b) The CPA shall not be deemed complete nor adequate until approved by the Department in writing. In the event of a dispute on the content of the CPA the decision of the Department shall be final and remain in effect unless and until stayed, modified or remanded by the Court on the ground that the Department's decision is unreasonable.

(c) At a minimum the CPA shall assure that the waste water treatment plant and sewerage system improvements are completed in compliance with the following time schedules and priorities:

(1) Completion and placement in operation of the Solids Management Program at Jones Island and South Shore shall be accomplished by no later than July 1, 1982;

(2) The Relief Sewers projects shall be completed by no later than July 1, 1983;

(3) The Waste Water Treatment Plant Facility Improvements projects shall be completed by no later than July 1, 1982;

(4) The Sewer and Plant Rehabilitation projects, other than the main and intercepting sewer system rehabilitation and combined sewer overflow projects, shall be completed by no later than July 1, 1983;

(5) The New Trunk Sewers to serve District projects shall be completed by no later than July 1, 1982; and,

(6) The New Trunk Sewers to serve Contract Areas projects shall be completed by no later than July 1, 1982.

5. Annual Schedule Establishment.

Beginning in 1977, by the end of October of each year, the Commissions shall establish the progress to be made, the

compliance schedule to be met, and the dollar appropriations to be obligated for each project in the following calendar year. This annual schedule establishment ("ASE") shall not become effective until approved by the Department. It shall take into consideration the time frames set forth in the CPA, and the amount, if any, of federal or state financial assistance which is expected to be available for each project in that year. In determining the manner in which federal, state, and local monies will be obligated for the year, the Commissions shall give priority in accordance with the following:

Priority 1: Completion of the solids management program at both South Shore and Jones Island treatment plants by no later than July 1, 1982;

Priority 2: Completion of relief sewers by no later than July 1, 1983;

Priority 3: Completion of waste water treatment plant facility improvements by no later than July 1, 1982;

Priority 4: Completion of sewer and plant rehabilitation, including collection sewer system rehabilitation;

Priority 5: Completion of combined sewer overflow abatement project;

Priority 6: Completion of new trunk sewers to serve District, and

Priority 7: Completion of new trunk sewers to serve contract areas.

B. Correction of Wet Weather Bypassing and Overflowing in the Separate Sewer Areas of the District and Contract Areas.

1. It is recognized by the parties that correction of wet weather bypassing and overflowing in the separate sewer areas of the District and contract areas is best addressed by a district-wide effort coordinated by the Commissions.

2. The Commissions shall coordinate the District-wide Sewer System Evaluation in the separated sewer areas of the participating municipalities, consisting of the System-wide Infiltration/Inflow Analysis and the Sewer System Evaluation Survey. As a result of those studies, the Commissions shall submit to the Department a program for correction of wet weather bypassing and overflowing for each participating municipality, including a designation of correction work to be done and a determination of the length of time required to complete that work.

3. The Sewer System Evaluation Survey Report for each participating municipality shall be reviewed and evaluated by the Department, and shall not be deemed acceptable until the Commissions are so notified in writing by the Department.

4. The Sewer System Evaluation Survey Report for each participating municipality shall be submitted to the Department by not later than July 1, 1980; at a minimum, it shall identify a time schedule which assures that all designated corrective work in each participating municipality is completed by not later than July 1, 1986.

5. The Commissions shall establish appropriate time schedules and monitor progress to ensure that completion of wet weather work in each participating municipality shall be accomplished by the individual participating municipality by not later than July 1, 1986. Such schedules are subject to approval by the Department. In the event of a dispute between the Department and the Commissions over the schedule, the Commissions shall be governed by the Department's schedule and enforce it according to this section. Such determination shall be final and remain in effect unless and until stayed, modified or remanded by the Court on the ground that the Department's decision is unreasonable. The Commissions shall deny without exception any request for extension of sanitary sewers or additional waste loading from any participating municipality not meeting the schedules established hereunder.

6. Nothing in this section shall prevent the Commissions from entering into contracts with participating municipalities providing for completion of the designated corrective work by the Commissions by not later than July 1, 1986.

7. The Commissions shall take all possible steps to assure that each participating municipality completes the correction of wet weather bypassing and overflowing within its separate sewer areas by not later than July 1, 1986, regardless of the availability of state or federal financial assistance for those projects. The decision to bring suit in the name of the Commissions against a given municipality for failure to comply with this requirement rests with the Commissions. The Commissions' decision will in no way be deemed to bar the Department or the State of Wisconsin from bringing suit against a given municipality for violation of this requirement.

C. Correction of Wet Weather Bypassing and Overflowing in the Combined Sewer Areas of the City of Milwaukee and the Village of Shorewood.

1. It is recognized by the parties that the District contain approximately 27 square miles served by combined storm and sanitary sewers located in and owned by the City of Milwaukee and the Village of Shorewood, which bypass and overflow during and immediately after periods of wet weather. It is further recognized that correction of the combined sewer overflow ("CSO") problem is best addressed by a district-wide effort implemented by the Commissions.

2. As part of the obligation set forth in section A.1., the Commissions shall raise and obligate sufficient local funds to enable them to obligate available federal and state funds to assure accomplishment of the CSO abatement project on the following schedule:

(a) Completion of design work by July 1, 1981;

(b) Completion of construction and achievement of applicable water quality standards by July 1, 1993; and

(c) Beginning in 1978, by July 1 of every year the Commissions shall submit to the Department a progress report on the combined sewer overflow abatement project detailing the current status of the project and the Commissions' best estimate of the work that will be completed in the subsequent year.

3. In the event that in any calendar year state and/or federal financial assistance is not available as set forth in section A.1.(a), the Commissions shall cause to be raised and obligated local funds in the following amounts annually toward the combined sewer overflow abatement projects provided, however, that projects included in priority category 3 and 4 under section A.5., above, may be undertaken if approved by the Department:

(a) For the period from January 1, 1983 thru December 31, 1996, not less than 13 million dollars annually in 1976 dollars;

(b) For the period from January 1, 1997 thru the completion of the combined sewer overflow abatement project, not less than the 1996 dollar equivalent of 13 million 1976 dollars annually.

D. Waste Load Restrictions and Apportionment

1. The Commissions shall establish necessary rules and regulations pursuant to their authority to restrict the amount of BOD_5, total suspended solids, and flow which are added to the sewerage system of the Commissions each year as a result of sanitary sewer extensions, industrial and commercial connections and contributions to new and existing sanitary sewers, and any new loadings via laterals in excess of 1,000 gallons per day of flow. Such additional

waste loadings per year shall be restricted according to the following schedule:

Year	Flow (mgd)	BOD_5 (Lbs. Per Day)	Total Suspended Solids (Lbs. Per Day)
1977	2.1	10,000	10,000
1978	2.1	10,000	10,000
1979	2.1	6,000	6,000
1980	2.1	5,000	5,000
1981	2.1	4,000	4,000
1982	2.1	3,000	3,000

2. Thereafter, in the event that violations of secondary treatment standards or the 1 mg/liter monthly average phosphorous limitation in the current permits have occurred at either the Jones Island or South Shore treatment plants in the previous year, or in the event that dry weather bypassing occurred in the sewerage systems in the previous year, additional loadings to the sewerage systems of the Commissions shall be restricted as follows:

Year	Flow (mgd)	BOD_5 (Lbs. Per Day)	Total Suspended Solids (Lbs. Per Day)
1983	1.0	2,000	2,000
1984	1.0	1,000	1,000
1985	1.0	1,000	1,000
1986 & Beyond	0	0	0

3. Said rules and regulations shall establish a mechanism for apportionment of the total additional load among the municipal customers of the District, including those within the District and the contract areas.

4. Said rules and regulations shall provide that the Commissions shall review and evaluate all requests for exten-

sion of sanitary sewers which would be tributary to the District sewerage system, and all requests for new or additional commercial and industrial connections and contributions for compliance with the rules and regulations. The Commissions shall then transmit each request which they deem approvable, along with the Commissions' evaluation, to the Department for its statutory review and approval or denial. The Commissions' primary responsibility for such review may, by rule, be delegated to the appropriate municipality.

5. By January 20 of each year, the Department shall notify the Commissions in writing as to whether the provisions of this waste load restriction schedule shall be in effect for that year. The Department's determination in this regard shall be accepted by the Commissions without dispute. If certification is given that treatment standards were met and that no dry weather bypassing occurred in the previous year, the Commissions shall restrict additional loadings in any subsequent year as necessary to assure continued compliance with this agreement and local ordinances and state and federal laws or regulations.

6. The rules and regulations adopted pursuant to paragraph D.1. shall require each municipal customer of the District, including those within the District and the contract areas, to agree to an acceptable program, time schedule, and financial commitment for correction of its wet weather overflow(s) or bypass(es) occurring from separate sanitary sewers. Such rules and regulations shall require that no municipality shall be eligible to utilize any portion of its additional waste load apportionment unless it has agreed to an acceptable program, time schedule, and financial commitment, and is meeting the deadlines established therein.

7. Said rules and regulations may, at the discretion of the Commissions, provide that in the event that the additional waste loading authorized by this section for a given

calendar year is not fully utilized in that year, up to 40% of that unused additional waste load may be carried over into the next year; provided, however, that such portion carried over must be used within six months. If it is not utilized within that time period, said portion shall lapse. Such rules and regulations may also provide that up to 40% of the additional waste loadings authorized by this section for a given calendar year may be utilized in the preceding year. Waste loadings utilized prospectively shall then be deducted from the next year's allocations so that the total additional loadings do not exceed the maximum for that year.

8. There shall be no exceptions granted to the additional waste loadings authorized hereunder; provided, however, that said rules and regulations may, at the discretion of the Commissions, establish that sewer extensions approved by the Department of Natural Resources pursuant to sec. NR 110.05(5)(a), (b), (c), or (d) (effective date, October 1, 1976), shall not be considered in the calculation of the amount of the additional waste loadings utilized in that calendar year.

9. Rules shall be adopted within six months from the date of this Stipulation. The Commissions shall submit proposed rules to the Department at least thirty (30) days prior to adoption. In the event that the Department determines that said rules are inconsistent with federal or state law, Department administrative code rules, or the terms of this Stipulation, the Department may petition the Court for a ruling on that determination. The effect of the Department's petition shall be to stay the operation of the rules. That stay shall remain in effect until such time as there is a judicial decision that said rules, as proposed, modified, or amended, are consistent with federal and state law, Department administrative code rules, and the terms of this Stipulation. No additional waste load authorized by section D. of the Stipulation may be utilized except by operation of such rules.

E. Compliance Audit Report

1. Beginning on July 1, 1977, and every six months thereafter the Commissions shall submit to the Department a Compliance Audit Report ("CAR") providing the following information:

(a) A compilation of the preceding six months data of the effluent discharged from the Jones Island and South Shore treatment plants, setting forth violations as they occurred;

(b) A status report on the progress of each treatment plant and sewerage system improvement project, including an evaluation of future compliance with the time schedule applicable to each project;

(c) A financing statement which includes:

(1) A review of the local monies raised and obligated, the state and federal monies obligated, and the projects to which they were obligated in the preceding six months, and

(2) A projection of the local, state, and federal monies to be obligated, and the projects to which they will be obligated, in the succeeding six months;

(d) A report of the actions taken pursuant to the rules and regulations governing the Waste Load Apportionment.

2. The Department shall review the Compliance Audit Report to determine compliance with the terms and conditions of this Stipulation. Within ninety (90) days of the date of receipt of the CAR by the Department, the Department shall submit to the Court a Compliance Evaluation Report ("CER") certifying alleged violations.

F. Additional Provisions

1. The parties hereto recognize that it is in the public interest that their differences be expeditiously resolved. Nothing herein shall be deemed an admission for any purpose on the part of the Department, either Commission, or their respective officers, agents, or employes as to any of the matters material hereto.

2. This Stipulation shall not affect legal remedies available to any of the parties under law as to matters beyond the scope of this agreement.

3. It is understood that the Jones Island and South Shore treatment plant permits referred to herein will both expire on June 30, 1977. The Commissions agree that the Department shall, pursuant to ch. 147, Wis. Stats., propose, public notice, and reissue the present WPDES permits containing the current effluent limitations to the Commissions which shall require that all discharges from the sewerage systems and treatment plants owned and operated, either individually or collectively, by the Commissions be eliminated by July 1, 1977 or meet secondary and applicable water quality related treatment standards by that date. Accordingly, the Commissions agree to accept those permits as reissued. This paragraph does not preclude the Commissions from challenging general or special conditions other than the effluent limitations and their effective date.

4. Forfeitures and Monitoring Fees.

(a) The parties agree to try to the Court the question of forfeitures, if any, for alleged violations of WPDES permits no. WI-0024767 and no. WI-0024775, and their successor permits, occurring between the date of issuance of such permits and the date of this Stipulation. Such trial shall be held in July, 1977, or as soon thereafter as court time can be scheduled.

(b) The parties further agree to try to the Court the question of forfeitures for any alleged violations of WPDES permits no. WI-0024767 and no. WI-0024775, and their successor permits, or any alleged non-compliance with any date scheduled in the annual schedule establishment ("ASE") established pursuant to the provisions of section A.5. above in July of each succeeding year during the term of this Stipulation. Provided further, however, that such trial to the Court shall only occur if, after review by the parties, the question of forfeitures, if any, remains in controversy between the parties to this Stipulation.

(c) For the period from the effective date of this Stipulation to July 1, 1982, the Department of Justice agrees that in regards to alleged violations of WPDES permit effluent limitations, it will seek forfeitures for only violations of the monthly average effluent limitations, so long as the Commissions maintain consistent compliance with the terms of this Stipulation.

5. Each municipality within the District or contract areas may become a "participating municipality" within the terms of section B of this Stipulation by adoption of a resolution of commitment to the correction of wet weather related bypassing and overflowing within its sewerage system. Such resolution shall provide that the municipality will participate in the District-wide Sewer System Evaluation, and will implement the designated corrective program established as a result of those studies. The resolution shall further provide that in the event that sufficient federal or state funds are unavailable through the Commissions to finance the designated corrective program, the individual municipality itself will provide the necessary financing to assure completion of its wet weather correction program by the date established in the Sewer System Evaluation or by July 1, 1986, whichever occurs sooner. Upon receipt of each participating municipality's resolution, the Department shall review and evaluate that reso-

lution for satisfaction of the terms of this Stipulation. If the resolution is deemed acceptable by the Department, it shall so notify the municipality and the Commissions. Thereafter, requests for sanitary sewer extensions within that municipality may be approved by the Department pursuant to sec. NR 110.05, Wis. Admin. Code, or its successor section, subject to the rules and regulations of the Commissions concerning additional waste loading apportionment.

6. In the event that the Department of Natural Resources receives a commitment to a program for correction of wet weather related bypassing and overflowing within its sewerage system from a municipality not participating in the District-wide Sewerage System Evaluation, the Department shall make a determination as to its acceptability under the terms of sec. NR 110.05, Wis. Admin. Code, or its successor section. Upon final agency action as to the acceptability of such program and commitment, the Department of Natural Resources shall notify the Commissions in writing.

7. In the event that there is a violation of the terms of section D., Waste Load Restrictions and Apportionment, all requests for extensions of sanitary sewers tributary to the District sewerage system submitted subsequent to the violation may be denied by the Department.

8. In the event that the Commissions or their agent(s) are unable to comply with any event date in the ASE established pursuant to the provisions of section A.5. because of the happening of an event or events beyond their control, the Commissions may request the Department to amend that project schedule to extend the date by which they are to comply. In the event of a dispute the decision of the Department shall be final and remain in effect unless and until stayed, modified or remanded by the Court on the ground that the Department's decision is unreasonable.

9. The parties agree that the issues raised by the declaratory judgment action of the plaintiff City Commission shall be decided by the Court prior to the trial under section F.4.(a), above. If these issues are decided by the Court in the plaintiff's favor, such determination will not affect the terms or enforceability of this Stipulation nor the Judgment entered pursuant thereto with the sole exception that no forfeiture or other penalty may be assessed against the plaintiff for the period prior to June 30, 1977.

10. Violations of the Judgment entered pursuant to this Stipulation shall be subject to the provisions of sec. 295.01, Wis. Stats.

11. The Judgment entered pursuant to this Stipulation shall remain in full force and effect until all the terms and conditions of the Judgment have been fulfilled, or until otherwise modified by the Court.

12. This Stipulation and the Judgment entered pursuant thereto shall not affect other remedies available to the parties which are not the subject of the Stipulation or Judgment. The parties specifically recognize that during the period covered by the Judgment entered pursuant to this Stipulation, state and/or federal standards affecting water quality may be revised to provide tor stricter water quality related standards. Nothing in this Stipulation or the Judgment entered pursuant thereto absolves the Commissions from complying with such standards or the Department from enforcing them. However, the establishment and enforcement of any more stringent water quality standards than provided for in this agreement shall be through the rules and procedures then in effect under Department of Natural Resources' rule or state statute.

13. The Department will interpret and enforce this agreement consistent with sec. 147.021, Wis. Stats., or any successor section.

14. Any expenditure of local funds required to satisfy any condition of a court order or judgment entered against the City of Milwaukee, Sewerage Commission of the City of Milwaukee, or the Metropolitan Sewerage Commission of the County of Milwaukee, in the case of *People of the State of Illinois ex rel. William J. Scott* v. *City of Milwaukee, et al.*, case no. 72-C-1253, or expenditure of local funds required by any stipulation agreed to in said case, shall be considered local monies for the purpose of complying with the requirement of sections A.(2)(a) and C.(3) of this Stipulation insofar as such expenditure is consistent with the terms of this Stipulation.

Dated this 30th day of March, 1977, in Milwaukee, Wisconsin.

THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE

By /s/ DONALD LAPREST
Donald A. LaPrest, Chairman

Attest: /s/ ROBERT A. BORCHARDT
Robert A. Borchardt, Secretary

Dated this 30th day of March, 1977, in Milwaukee, Wisconsin.

THE METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE

By /s/ NORBERT A. FRIDL
Norbert A. Fridl, Chairman

Attest: /s/ ROBERT A. BORCHARDT,
Robert A. Borchardt, Secretary

Dated this 22nd day of April, 1977, in Madison, Wisconsin.

THE STATE OF WISCONSIN DEPARTMENT OF NATURAL RESOURCES

By /s/ ANTHONY S. EARL
Anthony S. Earl, Secretary

(Seal)

Dated this 25th day of May, 1977, in Madison, Wisconsin.

THE STATE OF WISCONSIN DEPARTMENT OF JUSTICE

By /s/ BRONSON C. LA FOLLETTE
Bronson C. La Follette, Attorney General

APPROVED this ——— day of ————, 1977.

STATE OF WISCONSIN
CIRCUIT COURT
DANE COUNTY

Case No. 152-342

THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE,
Plaintiff,

v.

STATE OF WISCONSIN DEPARTMENT OF NATURAL RESOURCES,
Defendant.

ORDER

Upon the foregoing Stipulation between the Sewerage Commission of the City of Milwaukee, the Metropolitan Sewerage Commission of the County of Milwaukee, and the State of Wisconsin Department of Natural Resources, and upon all the files, records and proceedings had herein;

IT IS HEREBY ORDERED that the Metropolitan Sewerage Commission of the County of Milwaukee be admitted as and is hereby made a plaintiff to this action.

Dated this 25th day of May, 1977.

BY THE COURT:
/s/ WILLIAM C. SACHTJEN
Circuit Judge

STATE OF WISCONSIN
CIRCUIT COURT
DANE COUNTY

Case No. 152-342

THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE,
Plaintiff,

METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE, *Additional Plaintiff,*

v.

STATE OF WISCONSIN DEPARTMENT OF NATURAL RESOURCES,
Defendant.

JUDGMENT

Upon reading and filing the annexed Stipulation between the Sewerage Commission of the City of Milwaukee, plaintiff; the Metropolitan Sewerage Commission of the County of Milwaukee, plaintiff; and the State of Wisconsin Department of Natural Resources, defendant, by their respective officers and by Bronson C. La Follette, Attorney General, and being fully advised in the premises:

IT IS HEREBY ADJUDGED, ORDERED AND DECREED:

1. That plaintiff, Sewerage Commission of the City of Milwaukee, is a municipal body corporate, with its office at Sewage Disposal Plant, Jones Island, Post Office Box 2079, in the City of Milwaukee, Milwaukee County, Wisconsin.

2. That plaintiff, Metropolitan Sewerage Commission of the County of Milwaukee, is a municipal body corporate, with its principal office at Sewage Disposal Plant, Jones Island, Post Office Box 2079, in the City of Milwaukee, Milwaukee County, Wisconsin.

3. That defendant, State of Wisconsin Department of Natural Resources, is an administrative agency of the

State of Wisconsin, with its principal office at 4610 University Avenue, in the City of Madison, Dane County, Wisconsin.

4. That the annexed Stipulation between the parties is hereby approved as fair and reasonable.

5. That the annexed Stipulation is incorporated herein by reference and its terms are adopted as the judgment of this Court.

6. That no costs are awarded to any party.

Dated this 25th day of May, 1977.

BY THE COURT:
/s/ WILLIAM C. SACHTJEN
Circuit Judge

Appendix I

STATEMENT OF FUNDING INTENT

Whereas, on June 16, 1976, Milwaukee County Executive William F. O'Donnell appointed an ad hoc committee designated the "Advisory Task Force on Metropolitan Sewerage Commission Development" to review the problems of adequate waste treatment in the District service area, and to recommend solutions to those problems designed to achieve the treatment standards and to accomplish the water quality goals of the FWPCA and ch. 147, Wis. Stats., and,

Whereas, the Task Force has estimated that a total program cost of $669.7 million (1976 dollars) will be required to accomplish these goals; and,

Whereas, the Department has estimated that $319.1 million in federal financial assistance will be available through fiscal year 1979 to the Commissions to finance the above-named waste water treatment facilities improvement with such estimates predicated on Congressional authorization and appropriation at $5 billion per fiscal year; and,

Whereas, the program of sewerage system improvement as recommended by the "Task Force" anticipates a contribution of twelve-and-one-half percent state funding of eligible project costs for the combined sewer overflow project; and,

Whereas, the continuous availability of state or federal financial assistance for the Milwaukee area projects will enable the necessary work to be completed in the most effective and expeditious manner; and,

Whereas, a Stipulation has been agreed to by the parties in the action entitled, *The Sewerage Commission of the City of Milwaukee and the Metropolitan Sewerage Commission of the County of Milwaukee v. The State of Wis-*

consin Department of Natural Resources, case no. 152-342; and,

Whereas, it is recognized by the parties to that Stipulation that they cannot bind the federal government nor obligate state or federal funds in advance, the parties to that Stipulation hereby state their mutual understanding that:

(1) It is the mutual sense of the parties to that Stipulation that the availability of state and federal funding will be essential to the timely completion of the requirements of this agreement; and

(2) It is the intent and policy of the Department, [consistent with its statutory and constitutional responsibilities,] to utilize available state and federal financial assistance to the maximum extent possible to enable achievement of water quality goals in the District.

(3) Nothing in this "Statement of Funding Intent" diminishes the Commissions' obligation to raise and expend local funds as called for by that Stipulation, to obligate the available federal and state monies, or, in the absence of available federal and/or state monies to expend the minimum local funds called for by that Stipulation.

Dated this 30th day of March, 1977, in Milwaukee, Wisconsin.

THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE

By /s/ DONALD LAPREST
Donald A. LaPrest, Chairman

Attest: /s/ ROBERT A. BORCHARDT
Robert A. Borchardt, Secretary

Dated this 30th day of March, 1977, in Milwaukee, Wisconsin.

THE METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE

By /s/ NORBERT A. FRIDL
Norbert A. Fridl, Chairman

Attest: /s/ ROBERT A. BORCHARDT,
Robert A. Borchardt, Secretary

Dated this 22nd day of April, 1977, in Madison, Wisconsin.

THE STATE OF WISCONSIN DEPARTMENT OF NATURAL RESOURCES

By /s/ ANTHONY S. EARL
Anthony S. Earl, Secretary
(Seal)

Dated this 25th day of May, 1977, Madison, Wisconsin.

THE STATE OF WISCONSIN DEPARTMENT OF JUSTICE

By /s/ BRONSON C. LA FOLLETTE
Bronson C. La Follette, Attorney General

APPROVED this ——— day of ————, 1977.